

**Impact of Cash Conversion Cycle on Firm Profitability and Liquidity:
Some Evidence from Pakistan**



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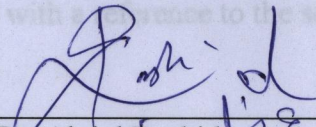


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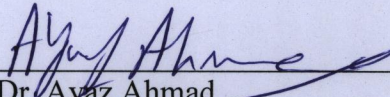
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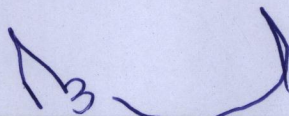
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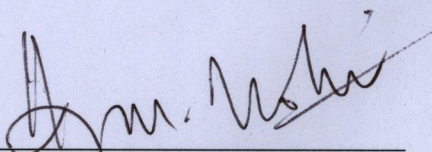
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I Shagufta Anwaar solemnly declare and affirm on oath that I myself have authored this MPhil thesis with my own work and means, and I have not used any further means except those I have explicitly mentioned in this document. All items copied from internet or other written sources have been properly mentioned in quotation marks and with a reference to the source of citation.

Shagufta Anwaar

Dedicated

To

My Beloved Daughters

Aliyya Abid

Aminah Abid

All my love to them because, having them made me feel the luckiest person in the world.

&

Of course my Honorable Teachers

Who educated me and made me believe that I can do everything.

This dissertation is for you!

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Abstract

This empirical study analyzes the impact of cash conversion cycle on firms' profitability and liquidity in Pakistan for the time period 2000 to 2014. For the purpose of this study, panel data of 387 non financial firms listed on Pakistan Stock Exchange is used. Panel data methodology is used for the analysis of the data. The results indicate that cash conversion cycle is significantly related to the profitability and liquidity levels of the firms. The findings further reveal that sales growth, firm size and also have significant effects on the firms' profitability and liquidity. The study also highlights the significance of cash conversion cycle as a proactive tool in the hands of management of firms. Moreover, firms are required to improve their cash collection and payment policy in order to enhance their profitability and liquidity positions.

Chapter 1

Introduction

1.1 Background of the Study

Traditionally, researchers in corporate finance¹ literature mainly focused on long term financial decisions. Academia have presented numerous studies analyzing investment, capital structure, dividend and company valuation (Aminu and Zainudin, 2015). However, for the last two decades, the interest in working capital management and its component in corporate finance have increased (Lyroudi and Lazaridis, 2000). Working capital management refers to management of current assets² and current liabilities of the business (Teruel and Solano, 2007). The optimum management of current assets and current liabilities³ contributes significantly to the better performance of firms (Jose et al., 1996; Eljelly, 2004). Researchers therefore, approached working capital management as an efficient and effective source of short term corporate financing and short-term investment decision (Ching et al., 2011).

This shifting contemplation towards working capital management makes it an important and vital component of corporate finance as it directly affects the profitability and liquidity of firms (Smith, 1980; Shin and Soenen, 1998; Deloof, 2003; Nazir and Afza, 2007). Therefore, it has been scrutinized by the researchers in many ways. Some researchers refer it as an investment cycle having short time expectancy and quick transformation from one investment form into another (Richard and Laughlin, 1980). Others consider that working capital management

¹ It is an area of finance that deals primarily with capital structure and sources of funds in corporations.

² These are resources owned by the firms and are normally convertible to cash within a one accounting period.

³ These are obligations of firms that are payable within one accounting period.

efficiency can be measured by the performance of its important components. These components include accounts payable, cash conversion cycle, operating cycle, inventory and trade credits.

In other words, working capital efficiency is based on the fundamental principle of speeding up collections of trade credits and slowing down disbursements under account payables head as much as possible. This working management principle is based on the customary concepts of cash conversion cycle introduced by Richards and Laughlin (1980). Empirical evidence in recent years shows that Cash Conversion Cycle (CCC) has become a significant and most effective measure to ascertain the efficiency of working capital management (Padachi, 2006). Richard and Lauhglin (1980) state that CCC is the most effective performance measure to evaluate the well management of working capital⁴ in any firm. Although the importance of CCC in measuring firms performance and liquidity is not a new concept and practiced by researchers like Gitman (1974) and later refined by Gitman and Sachdeva (1982).

However, recently the significance of CCC to measure a firm's performance and liquidity has been increased tremendously (Nobanee et al., 2011; Karaduman et al., 2010; Charitou, 2010; Layzaridis and Tryfonidis, 2006). Noting this mounting significance, researchers have begun giving more attention on CCC as a measuring tool for firms' performance (Ebben and Johnson, 2011). Smith et al. (1997) on one hand focused on liquidity and profitability as two leading objectives of working capital management and on the other hand emphasized on the importance of CCC as an effective measure of working capital management.

Theoretical and empirical literature both attempted to describe the CCC. The description of CCC has evolved overtime. Many scholars and researchers have approached and explain CCC

⁴ It refers to running cash available to firms in current periods after paying off their current liabilities.

in their own way. Stewart (1995) describes a CCC as a “composite metric describing the average period of time needed to turn a dollar invested in raw materials into a dollar collected from a customer”. Jose (1996) suggests that it measures the time between cash receipt from sale of goods and cash outlays for acquiring resources. Besley and Brigham (2005) refer it as an average length of time from the payment for the purchase of raw materials to until the collection of receivables associated with sale of the product. Richard and Laughlin (1980) define CCC as “a net time interval between actual cash expenditures on a firm’s purchase of productive resources⁵ and the ultimate recovery of cash receipts from product sales.” Encyclopedia of finance edited by Lee and Lee (2013) define CCC as “it is the net time interval between the actual cash outflows to pay accounts payable and the inflow of cash from the collection of accounts receivable.”

In fact, CCC and Operating cycles are two important measurements considered by investors in order to determine the financial health of a firm. Although both of these cycles measure how long it takes for money to flow into the business, but both cycles measure slightly different aspects of cash flow, and thus provide different information to investors about how well the business is doing. The operating cycle measures the time between receiving inventory or raw materials and receiving cash for them. The cash cycle measures the time between paying cash out for a variety of expenses and receiving cash into the business.

As a matter of fact, CCC represents the common observation that most of the firm’s inventories purchase or sale is not straightaway linked with cash outflows and inflows. Rather, firms buy or sale inventories at one time and pay or receive cash for those inventories at some later time. This is because of the fact that cash is an important but scarce economic resource and

⁵ Inputs like raw material required to produce outputs by the companies.

firms mostly do business on credit basis⁶ (Williams et al., 2012). Therefore, it is basically a difference on timeline between payments for inventories that is purchased on credit and collection against sale of those inventories if sale is made on credit basis (Nobles et al., 2015).

Cash conversion cycle measures how profitable the business is while the operating cycle provides information for the business about how long it takes to make and sell finished products. In other words, cash conversion cycle is the number of days required for a company to convert resources to cash flows (Bodie and Merton, 2000). Thus CCC is used to calculate the time period during which each input dollar is committed to production and sales processes before it is converted to cash through the accounts receivable process. Operating cycle on the other hand is the average time period between the acquisition of inventory and the receipt of cash from the inventory's sale. The cash conversion cycle may be used when preparing financial statements to measure how often cash flows into the business, and how much cash comes in relative to money going out for expenses. Both these cycles affect one another. If a business takes a long time to manufacture products to sell, it must keep inventory in stock for longer periods of time. Thus, the cash conversion cycle may become longer due to purchasing more inventories if the operating cycle becomes longer. Similarly, if the operating cycle is short, business owners can concentrate on selling as much product as quickly as possible, which make the cash conversion cycle shorter and stronger (Yazdanfer and Ohman, 2014).

Existing literature and different research studies discuss and explain the components of CCC. Lazaridis and Tryfonidis (2006) while working on the relationship between CCC as component of working capital management and profitability of firms describe that inventory, accounts receivables and account payables are fundamental component of CCC. On the basis of

⁶ Accrual accounting.

this description CCC basically refers to the idea of average number of days between the date when the firm must start paying its suppliers (APP⁷) and the date when it start collecting payments from its customers (ACP⁸). Teruel and Solano (2007) state the same fact about CCC as they described these components as an amount of investment in customer and inventory account and how much credit maintained with supplier. They also mention that keeping the CCC short adds to the profitability of the firms. In short, CCC as vital factor of working capital management (Gitman, 1974) plays a key role as predictor of firm's performance (Ebben and Johnson, 2011).

Academia studies on the relationship of firms' profitability and length of CCC over the period have consistently found that efficient and shorter CCC leads to higher returns in both large firms (Lazaridis and Tryfonidis, 2006; Deloof, 2003; Wang, 2002; Soenen, 1993; Jose et al., 1996; Lancaster and Stevens, 1996) and small firms (Teurel and Solano, 2007; Padachi, 2006). Length of CCC is an important element in establishing of the fact that CCC is significantly attributed the profitability and liquidity of firms. A shorter CCC is associated with high profitability as it improves the efficiency of using the working capital (Nobanee et al., 2011). Since short CCC reflects the fact that firm on one hand manages and process its inventory more quickly, collects cash from customers quickly and on the other hand slows down cash payments to its supplier. Gentry et al. (1990) support the same fact by stating that "short CCC not only reflects the fact that firm internal management of assets and liabilities are good but also contribute to the higher returns and market value of the firm."

Further, research studies reveal that length of CCC is an important factor in measuring firms' profitability and liquidity as business can be perceived as course of converting cash in

⁷ Average payment period.

⁸ Average collection period.

assets and assets back to cash (Jose et al., 1996). Shin and Soenen (1998) find a strong negative relation between the length of the CCC and firms' corporate profitability by taking sample of listed American firms for the period of 1975-1994. Lazaridis and Tryfonidis (2006) also establish a negative relationship between profitability and CCC which was used as valuable measure of working capital management efficacy. They suggested that managers can create higher profits for their firms by handling the length of CCC efficiently. In addition, by keeping the each vital component⁹ of CCC to an optimum level can ensure firms' profitability more effectively. In case of Pakistan, Rehman et al. (2010) analyzed the impact of working capital management on profitability of manufacturing firms using fixed effect. The results of the study also indicate that CCC significantly affects the firms' performance.

Horne and Wachowicz (2000) argue that for firms it is vital to manage current assets effectively as the major part of their total assets are composed of current assets. And managing the length of CCC is considered to be one of the key elements of effective management of current assets. Length of CCC can be minimized in manufacturing firms by reducing the time length of cash tied up in working capital. In principle this can be done by managing the three major components (ACP, ITID and APP) of CCC. By doing this the profitability of a firm can be maximized (Lazaridis and Tryfonidis, 2006). This could also be possible if inventory conversion period¹⁰ has kept short through faster processing and selling goods or products to customers or in other words reducing the time between sale on credit and cash received against that credit sale.

This can be done in other way by lengthening or slowing down the payments to suppliers (Nobanee et al., 2011). However, Wang (2002) points out that if inventory level is reduced

⁹ Average collection period, inventory turnover in days and average payment period.

¹⁰ Inventory turnover in days.

below substantial level then the firm will face the problem of losing chances of high sales. As right inventory level reduces the cost of interruptions during production process, and loss of business due to scarcity of products or goods (Blinder and Maccini, 1991). Although high inventory and generous trade credit¹¹ may reduce the risk of stock-outs¹² and leads to higher sales (Long et al., 1993; Deloof and Rajan, 1996) but the flip side of this generous trade credit policy and high inventory is that too much cash is locked or tied up in working capital (Deloof, 2003). As result financing and liquidity problem can be faced by the firms specially the small ones as small firms in contrast to large firms faced relatively more financing constraints (Whited, 1992; Fazzari and Petersen, 1993).

A longer CCC may lead to higher sales but the corporate profitability eventually decline since higher investment in working capital rises more swiftly than the advantages of holding inventory and granting generous trade credit to customers (Shin and Soenen, 1998). Although trade credit is a useful vehicle to accelerate sales as customers have the chance to check the quality of product before paying cash against it. However, these benevolent trade credits giving firms' financial department often face the problems of cash flows and liquidity. It is therefore witnessed that high growth firms if tied up more capital in inventory on one hand follow strict trade credit policy¹³ towards their credit customers on the other hand (Petersen and Rajan, 1997). So in order to have an optimum performance, liquidity equilibrium should be maintained in regard with the management of components of CCC (Lazaridis and Tryfonidis, 2006).

An empirical study by Deloof (2003) reveals that CCC components have a significant and negative relation with the firms' profitability. This study takes the sample of 2,000 non

¹¹ Arises out from credit sale

¹² Circumstances whereby demand for inventory is not fulfilled by current inventory on hand.

¹³ It is an average collection period and signifies the days required to convert the accounts receivable into cash. It is expressed in terms of days.

financial firms of Belgium for the period of 1991-1996 by using CCC as comprehensive measures of working capital management. Findings of the study pronounce that by reducing the time lag between the expenditures for the purchases of raw materials and the collection of sales of finished goods increases the firms' profitability. Fixed effect model is used for the estimation of determinants of corporate profitability as it explains the effects of those variables that are particular for each firm and that are constant over time.

Turuel and Solano (2007) provide in depth research evidence about the effects of working capital management measured by CCC on the profitability of sample of small and medium size firms. Panel data of 8,872 Spanish small and medium-sized firms for the period of 1996 to 2002 is used for the analysis. They suggest that by minimizing the CCC length value of the firms can be increased. Their results are consistent to those found in other previous studies focused on large firms (Jose et al., 1996; Wang, 2002; Deloof, 2003).

Corporate profitability is associated with better or successful management of working capital or resources. And this successful management of resources can be best measured by the CCC (Lazaridis and Tryfondis, 2006; Raheman et al., 2010). As ACP, ITID and APP are not only the three important aspects of working capital management but also the three prime determinants of CCC. Lazaridis and Tryfonidis (2006) explain this relationship by stating that profitability of a firm is directly affected by the optimum level of inventory turnover in days as it will release funds¹⁴ which will be invested back in the business cycle in form of new inventory purchase as a result product demand has met accordingly. Similarly, average collection period in terms of trade credits given to customer and average payment period in terms of credit policy from suppliers has its impact on profitability.

¹⁴ Working capital resources.

For the last one decade, liquidity management¹⁵ has become another important field to draw interest of financial managers in firms. Especially at the wake of the global financial crisis since the bank loans have become more expensive. This has diverted attention of the researchers and the managers of the firms to look into the liquidity management more closely (Owolabi and Obida, 2012). Managers of firms are devising different ways to maintain liquidity in day-to-day operation to ensure the smooth running of business and to meets obligations of business as they fall due (Eljelly, 2004). Liquidity is analyzed from the different aspects of firms' credit policy, cash flow management and CCC. Stewart (2009) states that during the recessionary environment¹⁶ firms despite of their size and nature of business, required to focus more on their cash inflows. CCC is considered to be the most efficient measure of corporate liquidity (Moss and Stine, 1993).

Theoretical studies and empirical literature both advocates the role of CCC as a good dynamic measure in evaluating firm's liquidity (Hager, 1976; Richards and Laughlin, 1980; Emery, 1984). Jose et al. (1996) explain that liquidity management (conservative¹⁷ or aggressive¹⁸) required optimum level of three key components of CCC and this can be done by increasing and decreasing length of CCC. Traditionally measure of liquidity, like current ratio and net working capital based only on static balance sheet entries. But CCC provides a dynamic measure for liquidity as it combines both income statement and balance sheet data with time dimension (Jose et al., 1996). In recent time popularity of conversion cycle as a dynamic measure of liquidity has been increased.

¹⁵ One of the key functions of financial manger in a firm, it ensures the right level of liquidity to minimize the risk exposure.

¹⁶ When GDP of a country shows a significant decline in economic activity over a period

¹⁷ This approach signifies that firms have high level of current assets especially cash, therefore firms having this approach usually have high current ratio and hence able to minimize the risk of cash shortages.

¹⁸ Maintaining low level of current assets as compared to total assets, this can also be characterized as position where percentage of current liabilities is greater than the long term liabilities in financing activities of firms.

1.2 Identifying the Gap in the Literature

The review of relevant literature on CCC and its impact on firms' profitability and liquidity reveals that this domain has been well researched in case of developed countries. However less empirical evidence is found in case of developing countries. In case of Pakistan, although the impact of working capital management on firms' profitability has been examined empirically but the direct impact of its important component CCC on firms' profitability and liquidity together has not yet been explored in depth. It is worth investigating and exploring the impact of one of the important component of working capital that is CCC on firms' profitability and liquidity.

In addition, most of the work done regarding CCC and profitability based on developed countries firms' experience but the organizational and capital structures of Pakistani firms are different from firms of developed countries. In this scenario, it is important to know the nature of relationship between CCC and firms' profitability and liquidity. In Pakistan, indirect impact of CCC on firms' profitability has been done by taking either small sample size of firms or firms from manufacturing sectors without further classifying them according to their respective industry type. But unlike those studies, the current research examines the impact of given relationship in perspective of not only the nonfinancial¹⁹ listed firms but also divides these firms in accordance with their respective industry in Pakistan.

¹⁹ These firms principally involve in the production of goods and non financial services. Financial transactions of these firms are independent of their owners and these firms include public listed companies, private listed companies and foreign listed companies.

1.3 Objectives of the Study

The study under reference examines the relationship exists among firms' cash conversion cycle, profitability and liquidity by taking the case of Pakistani non financial firms listed at Pakistan Stock Exchange²⁰. This relationship is further explored by auxiliary categorization of these firms according to their respective industry group. By doing this, the analysis becomes more relevant. The specific objectives of the study are as follow:

1. To examine the relationship between cash conversion cycle and profitability of non financial firms.
2. To study the impact of cash conversion cycle on liquidity in case of non financial firms.
3. To evaluate the impact of cash conversion cycle on firms' profitability in accordance with the nature of the business carried by the firms of different industries.
4. To explore the relationship of cash conversion cycle and firms' liquidity in context of the nature of industry in which non financial firms are engaged.

1.4 Research Question

Research questions defined to achieve the above mentioned objectives of the study are:

1. Does reducing the length of cash conversion cycle affect the profitability of non financial firms?
2. What is the impact of improving cash conversion cycle on the liquidity position of the non financial firms?
3. Does the nature of business affect the relationship of cash conversion cycle, profitability and liquidity of firms from non financial sector?

²⁰ Formerly known as Karachi Stock Exchange.

1.5 Significance of the Study

Much work has been done with regards to cash conversion cycle and firms' profitability and liquidity in developed countries. However, developing countries like Pakistan where corporate governance structure in firms is relatively different as compared to the developed countries (Shaheen and Nishat, 2005; Javid and Iqbal, 2010; Afza and Nazir, 2015), it is therefore valuable to study this relationship. Apart from this, the significance of the study is enhanced by the fact that this research is conducted on the basis of data collected from the non financial sector of Pakistan. This sector is dominated by manufacturing sector²¹ which is the second largest sector of Pakistan (Raheman et al., 2010) by accounting 13.3% of GDP (Economic Survey of Pakistan 2014-15).

Nevertheless, the manufacturing sector for the last one decade is experiencing slow growth due to energy crisis and lack of investment and technology (Tahir and Ahmad Anuar, 2015). Therefore, it is vital to analyze the impact of CCC on profitability and liquidity of firms belongs to this sector. Since returns and liquidity in relation with CCC vary from positive to negative from industry to industry (Uyar, 2009; Nobanee et al., 2011). This study further classifies the non financial sector into different industry types hence add to knowledge by in-depth analysis of the effect of CCC on profitability and liquidity among different industries.

In addition, the worth of the study is amplified due to the recent economic event of financial crisis. Since, the relationship among CCC and firms' profitability becomes more pronounced in economic downturn relative to economic booms (Enqvist et al., 2013). Financial crisis accentuates the importance of cash management (Bhunia, 2010). Therefore, it is beneficial

²¹ It refers to the sector that involves in the production of goods or products by using raw material, labor and factory overhead. It specializes in physical and chemical transformation of material or substances into new good.

to examine this relationship in the context of Pakistan. At the same time liquidity of the firms also faced intense pressure in absence of efficient and effective cash management (Campello et al., 2010). Hence this study contributes significantly in analysis of cash management with respect to non financial firms in Pakistan.

1.6 Plan of the Study

Current study is divided into six sections. Chapter 1 of the study gives the introduction that includes background of the study, gap in the literature, objectives and significance of the study and research questions. Chapter 2 presents the comprehensive review of the existing literature about the impact of CCC on firm's profitability and liquidity. Chapter 3 introduces to the theories regarding working capital management thereby built the theoretical foundation of the study. Chapter 4 describes the data collection and empirical models used to measure the effectiveness of relationship between CCC and firm's profitability and liquidity. This section also elaborates the estimation techniques employed in this research. Chapter 5 reports the findings and results derived from the given data with the help of empirical analysis. Chapter 6 encompasses the conclusion and policy implications made in the light of empirical results of the study under consideration.

Chapter 2

Literature Review

In past few decades various researches have been conducted that focused on studying the relationship between CCC²², profitability and liquidity of firms. Mostly, the results reported by these research studies reveal a significant and inverse relationship between the CCC and firms' profitability and liquidity. In the following, various such scholastic works have been cited that effectively discuss the relationship between the variable mentioned above.

Empirical work of Shin and Soenen (1998) encompasses the relationship between profitability and WCM²³ of firms. This study incorporates CCC as standard measure for WCM and used it as proxy for additional working capital requirement. The relationship is observed by employing correlation and regression analysis on dataset of 5898 firms for time period 1975-1994. Vital aspect of this research lies in the fact that it is conducted across the industry with different working capital intensities. Hence provides an in-depth analysis regarding the relationship between WCM and profitability. A strong and inverse association between profitability and WCM (measured by CCC) is reported in this study. Researchers suggest that reducing the length of CCC is an effective way to increase the profitability of firms.

Another study by Deloof (2003) examines the impact of working capital management on firms' profitability while using CCC as comprehensive measuring tool for working capital

²² Cash Conversion Cycle.

²³ Working Capital Management.

management. Study incorporates the financial data of 1,009 Belgium non financial firms for the period of 1992. Profitability is employed as a dependent variable and CCC, no. of days accounts payables, number of days accounts receivables, no. of days inventory, sales growth are independent variable in correlation and regression analysis of the study. Research applies two measures for profitability: gross operating income divided by total assets minus financial asset and net operating income is sales minus cost of goods sold, including depreciation and amortization.

This research unlike the previous one incorporates the panel data methodology for analysis purpose. Estimation results are derived from fixed effect model and concentrate on the effects of those variables that are particular to each firm and are remain constant over time. The findings of the study suggest that there is a negative relation between gross operating income and measures of working capital management (cash conversion cycle). In other words, decreasing the time lag between the expenditure for the purchase of raw materials and the collection of sales of finished goods has increased the profitability. Researcher further argues that most firms park large amount of their cash in working capital and best management of working capital actually add value to the firms in terms of profitability (Ebben and Johanson, 2011; Padachi 2006).

While, Deloof (2003) takes gross operating profit as a measure for profitability another empirical research by Nobanee et al. (2011) takes return on investment²⁴ as measure for profitability to test the relationship. Though, this study also states a significant and an inverse relationship between the length of CCC and firms' profitability. The significance of the study is vital because of the fact that reported results are based on the data of Japanese firms listed on Tokyo Stock Exchange. Although Japan is a developed nation but the organizational and

²⁴ It is a popular measure of profitability and calculated as net income/interest bearing debt + owner's equity

corporate structure of Japanese firms is much different from the firms of other developed economies as it is based on “keiretsu²⁵”. Study employs generalized method of moment for estimation to dynamic panel data of 34,771 firms covering the period 1990-2004. The dependent variable of profitability is measured through return on investment unlike the other studies. The explanatory variables include CCC and the differenced lagged value of dependent variable. The results indicate that the length of CCC has a significant and negative effect on firms’ performance or profitability. The lagged return on investment in the results reflects that the present performance of a firm is robustly affected by the performance of the previous period.

In accordance with the existing literature CCC and liquidity in small manufacturing firms are strongly related with each other as the small firms have limited access to lending institutions for funds (Moss and Stine, 1993). Ebben and Johanson (2011) examines the relationship between CCC and the level of liquidity and profitability in small firms by taking three year data (2002-2004) of 879 manufacturing firms and 833 retail firms operating in America. The result of this research provides significant contribution to the CCC literature in three distinctive ways. Firstly, it analyzes how CCC effects firm returns, liquidity and capital needs. Secondly, how in turn firm performance and liquidity influences CCC. Lastly, how over a period the relationship changes between CCC and firm performance, liquidity and capital needs.

This research based on stepwise regression analysis and uses CCC as an independent variable, invested capital, asset turnover, return on investment and liquidity as the dependent variables and size and industry as the control variables. The results support the inverse and significant relationship between CCC and firms’ performance and liquidity. Results thus reported are in consistent with the findings of empirical research done by Teural and Solano (2007),

²⁵It is a special grouping in which allied companies made an alliance with the aim to work for the mutual benefit.

Padachi (2006) and Deloof (2003) that shorter CCC has a positive impact on a firm's profitability. Positive significant relation between CCC and levels of invested capital thus reported is the confirmation of the findings of Soenen (1993). This study contributes in the existing literature as it also evaluates the impact of firm performance and liquidity on CCC. Thus indicates that firm performance and liquidity in turn have positive significant impact on CCC.

In 2006, Lazaridis and Tryfonidis, further extend the research of Deloof (2003) by evaluating the relationship between profitability, the CCC and its components for firms listed in the Athens Stock Exchange. They take the sample of 131 listed companies for the period of 2001-2004 having set of total 524 observations. In order to check the significance of relationship among various variables research incorporates regression analysis by running four regression models. All the regression models are tested for multicollinearity by using variance inflation factor (VIF). In first regression model gross operating profit which is used as proxy for profitability of firms is regressed against fixed financial assets, financial debt, CCC and industry dummy variables. The regression equation shows a negative relationship between profitability and CCC. This result reflects that profits generate more if CCC is decreased (Shin and Soenen, 1998). Further the finding of the study indicates that relationship between accounts payable and gross operating profit are positive and significant. This finding is consistent with the view that by delaying the payments of payables by firms enables them to maintain higher working capital. Firms use working capital in investments and hence the profitability of firms increases (Spiceland et al., 2003). Third regression model also observes a significant result by employing the accounts receivable instead of accounts payables as independent variable in regression equation. Results of third regression analysis indicate a negative relationship between gross operating profit and accounts receivables. This indication is supporting the view that by reducing

the credit period given to the customers' managers can add to the profitability of the firm (Jose et al., 1996). In last regression model in order to explain gross operating profit number of days for inventory is added with financial debt and fixed financial assets on independent variables side of the equation. Although the result reported the negative relationship but it's not highly significant. Outcomes of the research establish that a statistical significant relationship between profitability, measured through gross operating profit, and the CCC. Further, it concludes that in creation of firms' profitability managers can play vital role by adequately holding the CCC and this can be done by keeping the components of CCC to an optimum level.

Teruel and Solano (2007) contribute to the existing literature in two ways. Firstly, unlike the other studies they examined the relationship between working capital management and profitability on small and medium size enterprises instead of large companies. Secondly, test for endogeneity is included in the research. This is to make sure that the relationship found in the analysis is because of the effects of CCC on firm's profitability and not the effects of profitability on CCC. To analyze the effects of working capital management on profitability of SME panel data methodology is applied. This is for the reason that basic assumption of the panel data employs the existence of heterogeneity among firms. Panel data of 8,872 Spanish firms covering the period from 1996-2002 is taken. Return on asset is used to gauge the profitability in the regression model. The dependent variable is regressed against CCC which is used as independent variable. Firm size, growth in sales and leverage is included as control variables in the model.

Outcomes of this study provide a strong evidence of significant negative relationship between SME's profitability and the number of days accounts receivable and days of inventory. However, significance between the number of days accounts payable and return on asset

(measure of profitability) is not strongly evident. Results prove that working capital management is particularly important for small and medium-sized companies. As most part of SMEs total assets are in the form of current assets and their served as external source of their finance and by reducing CCC to a minimum reasonable level induce value creation for SMEs.

In case of Pakistan, valuable empirical research has been done. Afza and Nazir (2008) study the relationship between aggressive/conservative working capital management policies and firm's profitability by taking different industrial group for the period of 1998-2003. The results reflect that there is a considerable difference across different industries in regard with working capital and financing policies. Also, firms with aggressive working capital policies experienced less returns. However this research mainly concentrates on the financing policies of WCM. Empirical research of Raheman and Nasr (2007) although analyze the impact of WCM on a firm's profitability by taking relatively large number of firms but ignore the fixed effect of each firm present in the sample set and their sector wise analysis. They find significant negative relationship between net profit and average collection period, inventory turnover in days and average payment period. Iqbal et al. (2014) consider only textile sector of Pakistan for analyzing the relationship between CCC and profitability. This research work incorporates the moderating effect of management policies while analyzing the relationship between CCC and profitability. Finding of the study indicates that by reducing the duration of CCC and investment in current assets firms can increase their profitability.

However, research by Rehaman et al. (2010) is notable as it incorporates the data of almost 240 listed manufacturing firms for the period of 1998-2007 in order to check the impact of WCM on firm's profitability. Firm's profitability is measured through net operating profit (NOP) and it is regressed against various independent variables like average collection period,

inventory turnover in days, average accounts payable CCC and net trade cycle. Firstly, Pearson correlation coefficient is calculated to check the nature of relationship among various variables (NOP and all independent variable). Secondly, affect of WCM on firm's performance is evaluated on the basis of panel data methodology. Thirdly, finding shows that NOP is negatively associated with various measure of working capital management. Where these measures include average collection period, inventory turnover in days, CCC and net trade cycle. Reported results imply that making early and efficient collection from customers (accounts receivable) and keeping inventory for lesser period have positive impact on firm's profitability. While, less profitable firms required more time to pay their supplier. Lastly, regression analysis suggests that NOP can be improved by the manager of a firm through increase in gross working capital turnover ratio. Although the research is extensive but it does not reflect on the relationship exist between the liquidity and CCC of the firms. In addition the study does not explain the changes in the nature of relationship exist among firms' profitability, liquidity and CCC across different industry groups.

Chapter 3

Theoretical foundations

This section incorporates different theories of working capital management. Since cash conversion cycle (CCC) is a dynamic measure of working capital management, therefore it is essential to know the relevance of these theories in CCC (Aminu and Zainudin, 2011). Furthermore, it also includes the description of basic components of cash conversion cycle.

3.1 Agency and Stakeholder Theory

Over the last few decades, agency theory has been recognized in financial economics²⁶ literature as the leading theoretical paradigm (Ross, 1973; Jensen and Meckling, 1976). Initially agency theory was only concerned with the relationship between stockholders and managers however, later researchers begun to explore the entailment of agency theory on disciplines like organizational theory²⁷, organizational behavior and strategic management²⁸ (Eisenhardt, 1985, 1988; Kosnik, 1987). Agency theory has been applied by different research scholars in disciplines like finance, accounting, marketing and economics. The main characteristic that made agency theory popular among researchers of various fields is that it clearly allows the researchers to employ conflict of interest and incentive problems in their models (Hill and Jones, 1992).

Agency relationship is explained as “one or more persons (the principal(s)) appoints another person (the agent) to perform definite duties or tasks on their behalf by entrusting some

²⁶ It is an important field of economics, which encompasses decisions regarding the use and distribution of resources in market under indecisive circumstances.

²⁷ It includes different approaches regarding organizational analysis.

²⁸ Basically it is define as set of all those apparatuses that would aid the organization in achieving its objectives and goals.

decision making powers to that appointed agent (Jensen and Meckling, 1976).” Agency theory cornerstone lies in the postulation that interest of principal is differ from the interest of an agent and this difference can be minimized by giving incentives and payment to the agent to operate the resources of principal effectively (Hill and Jones, 1992). Expenditure on agent’s monitoring and bonding is termed as agency costs and agency theory pronounces that natural selection processes are in favor of governance structures in minimizing this agency cost (Fama and Jensen, 1983). Thus, the central point of agency theory is that how the interest of principals (shareholder and owners) can be looked after by ensuring the acts of agents (executives and managers) to be in the best interest of the principals (Aminu and Zainudin, 2011).

The term stakeholder refers to the different group of people having a legitimate claim on the firm (Freeman, 1984). Different group of these stakeholders include stockholders, creditors, managers, employees, customers, suppliers and the general public. March and Simon (1958) view each of these groups as an important resource contributor in terms of capital, finance, revenue and human capita in a firm and in return expects that its interest would be satisfied maximum. These stakeholders are further classified according to the size of their stake in firm but whatever the magnitude of their stakes in firms all these stakeholders are the part of nexus of implicit and explicit contracts that constitute the firm.

However, one group of the stakeholder known as managers have special place because this is the only group of stakeholders who enter into the contractual relationship with all the other group of stakeholders. In addition, managers have the direct control over the decision making apparatus in the firm unlike the indirect control with the owners. Therefore, they are in position

to make strategic decisions²⁹ and allocate resources by safeguarding the interest of all the stakeholders of the firm. This special position of the managers makes them an agent to stakeholders; hence the agency – stakeholder theory term evolved (Eisenhardt, 1989).

The relevance of agency theory to working capital management could be examined from the insight of financial manager. In firms financial manager mostly acts as an agent of the owners (principals), taking all the important and strategic decisions regarding short term assets and liabilities of a business (Donaldson and Davis, 1991). This strategic decision making is more precisely termed as working capital management. And working capital management is very important in corporate finance as it directly affects the profitability and liquidity of the firm (Appuhami, 2008; Christopher and Kamalavalli, 2009). Robbins and Coulter (2012) state that manager in an organization has to follow certain policies to ensure the better performance of the firm. And this can be done through better management of resources (inventory and accounts receivable) and liabilities (accounts payable) in the light of stakeholder and agency theory (Aminu and Zainudin, 2015). As discussed earlier that manager as an agent should act in the welfare of the stakeholder of the firms. Resources and liabilities in fact are different components of CCC so in other words, CCC efficiency is dependent upon the right decision of the manager who is an agent according to the agency stakeholder theory (Rampling, 2012). This can also be true by the fact that manager is in better position for the optimal utilization of various components of CCC.

Furthermore, managers spend considerable time on day to day problems that involve working capital decisions (Raheman and Nasr, 2007). The stakeholder concept in working capital management can be measured by the fact that stakeholders provides source of finance to

²⁹ These decisions involve the long term and the challenging decisions taken by the senior management.

the firm and in return expect their interest would be safeguarded best (March and Simon, 1958). For instance, creditor one of the stakeholder of a firm when provide loan (finance) to the firm in exchange expects timely payment of interest plus the repayment of his loan on schedule. Stockholders another important stakeholder of firm expect a maximum returns on their investments in trade of the capital provided to the firm by them. Stakeholder–agency theory basically built a paradigm that describes certain factors of strategic behavior of the firms. This strategic behavior includes institutional policies that govern the contract (implicit and explicit) between stakeholders and agents (managers). Further it encompasses the structure of incentives for minimizing diversion of interest among different stakeholders (Connelly et al., 2011).

The interest of the stakeholders can be best served if a manager who is an agent to all stakeholders efficiently and effectively performs working capital management. And efficiency and effectiveness of WCM can be best measured through CCC (Richard and Laughlin, 1980). Reason for this rests in the fact that current asset (account receivables) as component of CCC are short lived assets that are continually being converted into another assets (cash) types (Rao, 1998). And the liquidity and profitability of the firm both are dependent upon the length of this conversion period (Smith, 1980). Level of individual’s stake depends upon the extent of his exchange of relationship and commitments with the firm which is based on specific asset investment (Williamson, 1984). While components of CCC actually reflect investment in different assets, like accounts receivable and inventory. While the optimal level of these assets ensures better flow of cash which is a major source of finance in firms.

3.2 Risk and Return Theory

Desai and Wright (2008) state that risk and return theory plays a significant role in working capital management. Risk and return liaison get attention of many scholars from various fields of economics, finance and business (Desai and Wright, 2008). Decisions taken in respect of investment³⁰ and working capital management are primarily based on risk and return relationship (Richard et al., 2008). Risk management is one of the major elements in financial decision making. Markowitz (1952) is probably the first researcher who quantifies the relationship between risk and return in his portfolio theory³¹. He quantifies the relationship by using standard statistical techniques (standard deviation and variance). Risk is always associated with two divergent attributes one is risk-seeking and the other is risk-aversion behavior. Focal point of risk seekers is to maximize the opportunities of gains (Tiegen and Brun, 1997) as they prefer alternatives having greater probability of loss but at the same time strong notion of gains are also associated with them. On contrary, risk-averters overestimate losses and underestimate gains.

According to the theory of risk and return, investment yielding higher return is associated with higher risk. Therefore, firms with high liquidity of working capital will have less risk of insolvency as they are in position to meet its obligations as they fall due. And this liquidity is dependent upon the length of CCC. Shorter lengths of CCC induce better liquidity (Smith et al., 1997) in addition, firms also have high chances of profitability (Teruel and Solano, 2007; Zariyawati et al., 2009). To stay in business, earning profit is not enough for a firm but decision makers also focus on effective cash management. It is vital to maintain a balance between

³⁰ An appropriation of resources in order to yield returns or gains.

³¹ Hypothesis given by Harry Markowitz, it states “risk-averse investors can minimize their risk and maximize their expected returns by careful construction of portfolios.”

liquidity and profitability of a firm as it is not necessary that highly profitable firm also have a good liquid position (Padachi, 2006). Effective and efficient working capital management based on risk and return postulate is required to ensure profitability and liquidity of a firm (Peel and Wilson, 1996). Prime integration of risk and return theory with working capital management is based on the cardinal principle that one of the basic objective of working capital is to take decisions in regard with the tradeoffs between liquidity and profitability (Lundblad, 2003).

Worldwide economic crisis³² in 2008 has reduced the amount of money available to firms (Brunnermeier, 2009). Therefore, in order to create value of firm time span between cash inflows and outflows should be minimized while optimizing the cost and quality (Ruyken et al., 2011). Thus, twofold objective of profitability and liquidity should be synchronized in a way that none of them intrude each other for longer period (Padachi, 2006). Since, it is impossible to own every resource, decisions regarding the composition of various components of CCC in respect of tradeoffs between profitability and liquidity fall under the domain of risk and return theory (Aminu and Zainudin, 2015). If resources³³ are blocked too long in an asset (inventory, accounts receivable) it will affect the liquidity of a firm as the cost tied up in working capital has exceed the benefits of holding more inventory and granting more trade credits (Shin and Soenen, 1998; Ebben and Johanson, 2011). On the other hand, firms lost sales with strict credit terms³⁴ and firm's credit reputation damaged by increasing the payable period (Nobanee et al., 2011).

Asset-liability mismatch often occur for short period of time sometimes it will increase firm's profitability at the cost of liquidity. Conversely, too much liquidity centric policy although stimulates the better liquidity position of the firm but this is done at the expense of firm's

³² Financial crisis of 2008, many economist termed it as the worst ever crisis after great depression.

³³ Current assets in form of cash.

³⁴ Refers to less time given to debtors to settle down their payment.

profitability (Padachi, 2009). Success of business is heavily dependent upon the effective skills of financial managers (Filbeck and Krueger, 2005; Nazir and Afza, 2009). And financial manager's biggest challenge is to maintain a desired level of tradeoff between liquidity and profitability in order to create value for the business. In other words, risk and return theory helps in keeping the optimum balance between profitability and liquidity in working capital management (Ricci and Di-Vito, 2000).

Table 1.1 describes the scenario of risk and return, involves in excess or shortage of different components of working capital.

Table 1.1 Impact of excess and shortage of current asset on firm's profitability and liquidity.

Current assets	Excess	Shortage
Cash	Excess of cash is considered as idle cash as it is not adding to the earning capacity of a firm. Which in turn reduce the profitability of a firm.	Its shortage on the other hand causes problems of liquidity. Which result in the inability of the firm to make payments, disruption in operation and therefore affects profitability of the firm in negative manner.
Inventory	Excess of holding affect the opportunity cost. As, if the price decline for this holding inventory	Conversely, limited supplies halt production process, increases cost. As a result,

firm won't be able to get this benefit sales disturbed and so is resulting in low profitability. profitability of a firm.

Excess is associated with speedy Lower turnover leads to less and efficient collection of it. Which cash inflows. As a result

Accounts Receivable increase the chances of default on liquidity position of a firm the part of debtor. Resulting in bad affects.

debts³⁵.

3.3 Resource Based Theory

A firm's profitability and survival is greatly influenced by its resources. For the past one decade, resource based theory has evolved tremendously to become one of the most prominent and influential theories for better understanding of organizations (Barney, 2011). Resource based view of a firm has emerged as a leading research area particularly in the field of strategic management (Peteraf, 1994). It asserts that success of a firm is largely dependent upon the type and characteristic of the resources it owns or possesses (Galbreath, 2005). Heterogeneity of resources is the basic underlying assumption of resource base theory. It postulates that heterogeneity exists among the population of firms in respect of some resources and capabilities (Barney, 1991; Peteraf, 1993; Hoopes et al., 2003).

These resources could be either material or human. Also, distinction should be made between resources and capabilities (Aminu and Zainudin, 2015). Capabilities of firms here refer to operational capabilities. Winter (2000) defines operational capabilities as "a high level routine

³⁵ It is considered as loss to firm when cash is not recovered from the debtor.

(or collection of routines) that, together with its implementing input flows, confers upon an organization's management a set of decisions options for producing significant outputs of particular type". A Firm's distinctive capabilities in form of technical know-how and managerial skill are basic cause of heterogeneity that foster sustained competitive advantage³⁶ (Mahoney and Pandian, 1992). Over the period researchers have become highly aware of this competitive advantage that arises out of the heterogeneity of resources across firms (Dierickx and Cool 1989). In terms of productivity or output all resources are not equal. Optimum productivity of some of the resources are limited if they are employed individually. Although, capabilities and resources are different from each other but they have symbiotic relationship with each other. As optimum productivity of resources requires coordination and cooperation of group of resources and this ability of coordination among group of resources is termed as capability of the resource (Grant, 1991).

Resource based theory is employed in working capital management in the context of individual manager's ability that ensure effective and efficient administration of short term assets³⁷ of the firm (Alvarez and Busenitz, 2001). The efficient administration of short term asset will then add to the profitability of the firm (Gill et al., 2010; Raheman et al., 2010). Therefore, it implies that manager have specific set of resources that will facilitate and explore chances of new opportunities, effective assembling of resources, better method of making payments, and recovering of receivables. In short, better allocation and maintenance of resources among different components of CCC reflect the resource based conceptual framework of working capital management.

³⁶ Capacity of an entity to foster more returns and wealth of shareholders than its competitors.

³⁷ Current assets including cash, cash equivalents, marketable securities, accounts receivable, inventory.

3.4 Pecking Order Theory

Pecking order theory is one of the most influential and popular theories of capital structure in finance (Frank and Goyal, 2003). It explains priorities among different modes³⁸ of financing followed by firms. Myers (1984) suggest, that firms prefer internal source³⁹ of financing over external source because of unfavorable terms of external (market) finance. Shyam-Sunder and Mayers (1999) argue that pecking order theory basically shows a financing behavior of publicly traded firms. Corporations over the time raise finance on the basis of information asymmetry. It means management is in better position and has good opportunities than any other entity in the financial market to take financing decisions and management can never be forced to issue stock when the stock prices are depressed in the market (Lee and Lee, 2013). Empirical evidence supports, that firm mostly depend on their internal resources (retained earnings⁴⁰) to finance capital projects. Nevertheless, if they need external financing or resources they prefer to issue debt instrument⁴¹ rather than equity⁴² (Mayers, 2001) because debt instrument poses less risk to investors and provide lower cost to firms (Ferreria and Vilelea, 2004; Han and Qui, 2007).

Mayers and Majluf (1984) argue that information asymmetry assists firms to design specific hierarchy in utilization of resources. According to hierarchy theory firms having less exposure to capital market rely more on internally generated resources for financing. In addition small and new firms are often reluctant for outside financing because of their inexperience in raising outside debt, unfavorable demands of banks and investors and they are more risk averse

³⁸ External financing and internal financing.

³⁹ Retained earnings

⁴⁰ It represents the percentage of an amount from the net income that has been retained or kept by the business for future investment and service of debt.

⁴¹ It means loan from financial institutions and issuance of bonds.

⁴² It refers to a share or security that represents the ownership right.

(Cassar, 2004; Bhide, 2000). Watson and Wilson (2002) confirm that closely-held firms where information asymmetries are more obvious look for internal methods of finance before looking for external debt. Pecking order theory assumes that firms are not adamant in setting target capital structure rather they choose capital according to the following preference order: internal finance, debt and equity (Zoppa and McMahon, 2002).

One of the major sources of internal finance is retained earnings, that provides working capital hence of vital importance for the firms in terms of short term financing (Tureul and Solano, 2007). And CCC is an exclusive financial metric that shows how well firm is handling its capital (Hutchison, 2007). Working capital is the surplus of current assets over the short term liabilities and reflect the liquidity margin⁴³ available to the firm to meet needs of its daily operations and advantage of profitable investment opportunities (Schilling, 1996; Padachi et al., 2008; Yadav et al., 2009;). Pragmatic evidence supports that some firms specially the small ones follow pecking order even in time of their growth (Norton, 1991; Carpenter and Peterson, 2002). Since limited access to capital markets⁴⁴ forces these firms to hold cash reserves (D'Mello et al., 2008) and these cash reserves serve as internal source of finance for them. Besides, Braun and Larrain (2005) argue that firms depend enormously on external financing suffer more badly in recessionary period. Capital constraints make cash flow management an important tool in working capital management of those firms. Efficient and effective cash management is an endorsement to better working capital which in return reduces or may eliminate the necessity for outside funds (Ebben and Johanson, 2011).

⁴³ It is a liquidity ratio measured as $\text{current assets} - (\text{inventory} + \text{prepaid expenses}) / \text{current liabilities}$. An ideal liquidity margin is considered as 1:1 meaning for every one current obligation there is one current asset in a firm.

⁴⁴ These markets are primary source of finance for corporations. They circulate wealth among entities through shares, bonds and other investments.

3.5 Components of Cash Conversion Cycle

Basley and Brigham (2005) identify CCC as “an average time period between payments for the purchase of raw materials used in production of goods and the collection of receivables from sale of those goods.” Therefore three basic components of CCC are inventory turnover in days, average collection period in days, and average payment period (Lazaridis and Tryfonidis, 2006).

3.5.1 Inventory Turnover in Days

Inventory is a physical material use to make products by firms. It is an asset by definition of accounting⁴⁵ because firms physically own them and it is used to generate future economic benefits (Chandren, 2015). Inventory fall under the category of current assets as it is assumed to be sold within the period of one accounting period⁴⁶. Inventory includes supplies, raw materials, work in process and finished goods in manufacturing sector. Different classification of Inventory makes up an integral part of almost all business operations (Brigham and Houston, 2007). However, firm’s inventory may take different forms according to the nature of business in which it is engaged. For manufacturing firms it consists of raw materials, work in process and finished goods but merchandising firms normally have only finished goods in their inventory (Preve and Allende, 2010). Raw materials are components or inputs used in making of final product. Work in process on the other hand indicates inputs still in the process stage of production. While finished goods refer to the final product available for sale (Muller, 2003; Moles et al., 2011).

Currently, empirical research in the field of operational management analyzed various traits of firm’s performance by using financial data on inventories (Khuswaha and Gaur, 2012).

⁴⁵ It is process of recording, classifying and communicating financial data of an entity.

⁴⁶ A time period for which firms are reported their financial statements.

Stable and consistent working capital a contributor to firm's profitability rely on efficient management of inventory. Firms always strive to maintain an optimum level of inventories (Lazaridis and Tryfonidis, 2006). Therefore, inventory management is a vital part of effective working capital and it involves setting of inventory in such a way that it will maximize the benefits and minimize the costs of holding inventory.

There are two underlying reasons of maintaining inventories by the firms firstly to get the benefits of buying larger quantities from supplier at less expensive rate and secondly, to meet customer's demand and quick delivery of product (Finnerty, 2006). Although, there are many approaches to manage inventory but best among them is economic order quantity (EOQ) approach as it is based on the concept of minimizing costs linked with inventory management (Muckstadt and Sapra, 2010). Besides, there are two important measures for optimal investment in inventory one is inventory turnover in days⁴⁷ and the other is inventory turnover⁴⁸ (Preve and Allende, 2010). Inventory turnover in days also known as inventory period reflects the average number of days between purchase of inventory and final sale of that inventory. Longer production period means cash of the firm is also tied up in inventory for longer period (Brealey et al., 2001). Inventory turnover on the other hand tells the number of times inventory turns into sales. Researcher used number of days inventory as proxy for inventory management in CCC to measure firm's profit and liquidity (Lazaridis and Tryfonidis, 2006; Nobanee et al., 2011).

⁴⁷ It is measured as $\text{inventory}/\text{cost of goods sold} \times 365$.

⁴⁸ It is measured as $\text{net sales}/\text{average inventory}$.

3.5.2 Average Collection Period in Days

Accounts receivable is an important part of financial assets⁴⁹ of firms that arise out from the selling of merchandise and services on credit to customers by firms (Gibson, 2013). The salient feature of accounts receivable is that firm expects to collect cash against them in some future time period. Firms normally sell goods on credit or account rather than on cash (Mian and Smith, 1992) because it is a demand of customers, it increases sales growth, induces profitability (Ainsworth et al., 2000) and in competitive market it is a tool to compete with competitors. Accounts receivable include trade and notes receivables (Moles et al., 2011). It appears under the head of current assets and after marketable securities in balance sheet⁵⁰ of a firm and composes a large part of working capital of a firm (Finnerty, 2006).

Accounts receivable management is a challenging task as it requires trade-offs between conflicting goals of liquidity and profitability (Salek, 2005). To extend trade credits firms must assess the credit worthiness of the debtor⁵¹, credit terms⁵² and the risk of default borne by the firm (Schaeffer, 2002). Because if credit given to the debtor (customer or company) irrespective of its creditworthiness it will directly affect the profitability of the firm and resulting in high losses specially in recessionary period when cash is scarce (Moles et al., 2011). Long et al. (1993) suggest that trade credits helps in increasing sales volume as it provides customers a chance to check the quality of product before making payment. But the flip side of these generous trade credits is that resources (cash) lock up in the working capital (Michalski, 2007). Essential tools in making firm's account receivable or credit policy include credit standard, credit

⁴⁹ Liquid assets that are expected to be converted into cash in quick succession.

⁵⁰ Statement shows the financial position of a firm at a particular period of time. It is an extension of basic accounting equation (assets=liabilities+owner's equity).

⁵¹ An entity or a person that owes money.

⁵² A set of agreement between buyer and seller regarding the payment and the credit period.

period cash discount and collection effort (Prasana, 2001). Accounts receivable turnover⁵³ and average collection period in days⁵⁴ can be used as proxy for accounts receivable management in CCC (Deloof, 2003). Accounts receivable turnover, reflects the liquidity of receivables while average collection period signifies the time period required to convert the accounts receivable into cash receipts. By reducing the length of this time period firms can increase their liquidity positions of the firms. An additional benefit of this available cash is that it induces the investment decisions by the firms and hence increases the profitability (Porter and Norton, 2004).

3.5.3 Average Payment Period

Average collection period arises out of accounts payables of firms. Accounts payable represent the current liabilities owed by firms to its creditors and suppliers (Spiceland et al., 2004). Current liabilities are obligations that should be paid within the one accounting period by the firms. It arises because of the fact that most of firms make purchases on credit⁵⁵. In the words of Brigham and Houston (2007) “it constitute a single largest short term debt for firms thereby an effective source of short term financing crop up from the ordinary business transaction.” Furthermore Schaeffer (2004) asserts that firms should follow best practice in accounts payable management as it is fundamentally associated with a firm’s integrity regarding the timely payment.

⁵³ Net sales/ average gross receivables.

⁵⁴ Accounts receivable/net sales*365.

⁵⁵ Promise to pay cash against purchases in future.

Firms can take advantage of broader supply chain mechanism⁵⁶ for negotiating better terms of accounts payable with the suppliers or creditors⁵⁷ (Hutchison et al., 2015). Cash is a resource that every enterprise needs to allocate effectively in order to stay in the business. Average accounts payable period is used as proxy for payable management in CCC. Lengthening the payable period leaves positive impact on firm's liquidity. In short, firms can enhance their performances not only through better management of their resources but with better management of their sources as well. Sagner (2011) states the same fact by elaborating the significance of current liabilities and stress on the better and effective management of payables. The author further argues that firms should take keen interest in better management of current obligations as it provides a competitive advantage to firms in terms of cash (ibid).

⁵⁶ It involves all the procedures and processes concerning with the purchase of raw material and then making of finished goods from that raw material. It also encompasses the process to deliver that finished goods to an ultimate consumer.

⁵⁷ To whom a person or an entity owes money.

Chapter 4

Data and Methodology

4.1 Data Collection

In order to analyze the impact of cash conversion cycle (CCC) on firms' profitability and liquidity, a sample of 387 listed firms is drawn from the non financial sector of Pakistan. The primary reason to choose this market is the reliability and availability of financial data. Firms from banking and financial institutions, insurance and services sector are not included in the present study. The omission of these firms is due to the fact that definitions of various components of CCC are different for financial and services sector from the definitions being examined in this study (Deloof, 2003). The exclusion of financial firms is also based on the reality that these firms are engaged in business operations that are distinct from the business operations of firms under study (Charitou, 2010).

Further, non financial firms listed at Pakistan Stock Exchange having data available for three consecutive years are included in this study. A database is built on the basis of financial information available in financial reports⁵⁸ of 387 listed firms from the period 2000-2014. Financial reports are considered as source of data because these are published by the state bank of Pakistan being an authentic government body. Additionally, firms listed at stock exchange present true operational and financial activity in their statements (financial reports) in order to make their share more attractive (Lazaridis and Tryfonidis, 2006). Audited and consolidated financial reports are considered in order to avoid any further problems regarding

⁵⁸ These are financial statements appeared in annual reports describing the financial position of firms in term of assets, liabilities and owner's equity.

misrepresentation of financial information (Gracia and Mira, 2015). Consequently, empirical analysis is done on the time-dimension panel data from 2000 to 2014.

Moreover, in order to fully accomplish the objectives of the study under reference, four different industry groups⁵⁹ are selected from the nonfinancial sector. In fact, this selection facilitates the detail and in-depth examination of the relationship among cash conversion cycle, firms' profitability and liquidity. Hence this makes the analysis more useful and relevant. In addition, the present empirical research is also required to evaluate the impact of cash conversion cycle on firms' profitability and liquidity with reference to nature of the business in which the firms are engaged.

The four selected groups of industry include textile, sugar, cement and automobile industries. These four industries are selected because of their contribution either to foreign exchange revenue or to economic development in Pakistan. Over the years, textile industry in Pakistan has become one of the leading industries in earning foreign exchange revenue. This industry yearly earns more than 50% of the foreign exchange revenue and provides 40% employment to industrial force (Ministry of textile industry 2014-2015). In recent past, the performance of this industry suffers due to global recession and energy crisis. Therefore, it is beneficial to know how the profitability and liquidity of this industry is affected by the CCC.

The inclusion of cement industry in selected groups is due to its role in socio-economic development in Pakistan. Recently, the significance of the cement industry becomes more pronounced because of China Pakistan Economic Corridor (CPEC). According to the APCMA⁶⁰, nearly \$1 billion investment is observed in this sector in order to fulfill the future demand.

⁵⁹ These industry groups belong to the manufacturing sector of Pakistan.

⁶⁰ All Pakistan Cement Manufacturing Association.

Besides, this industry contributes Rs.7.5 billion to government revenue and employs almost 1.8 million of workforce (PBOS)⁶¹. It is therefore valuable to assess the relationship existing among CCC, profitability and liquidity of firms in this industry.

The reason behind the selection of automobile industry is based on the fact that for the last one decade this industry has flourished tremendously and shows a turnover of PKR 300 billion in 2014. In addition, this industry is the sixth largest subsector of manufacturing sector by employing 3.8 million people and contributing 3.8% to GDP of a country (Economic Survey of Pakistan, 2014). Although, this industry is fairly concentrated but it provides benefits to some allied industries like CNG, workshops and automobile spare part shops. With the growing urbanization⁶² phenomena, its vitality increases day by day therefore, it is of vital interest to analyze the impact of CCC on profitability and liquidity of firms operative in automobile industry.

Sugar industry on the other hand is the second largest agro-based industry in Pakistan and employs 1.5 million skilled and unskilled people (LCCI)⁶³. However, this industry faces enormous challenges in recent years. According to PSMA⁶⁴, the first task is to offload the surplus stocks in international market and thereby enhances the exports revenue. The second quest in front of sugar industry is to discharge liabilities of 225 billion owing to sugar growers. Thus, it is gainful to evaluate the nature of association that exists between the CCC and liquidity and profitability of firms operating in these industries.

⁶¹ Pakistan Bureau of Statistics.

⁶² Social process of by which cities grow and more people begin to live in cities.

⁶³ Lahore Chamber of Commerce and Industry.

⁶⁴ Pakistan Sugar Mills Association.

4.2 Variables and Model Specification

In order to measure the impact of CCC on firms' profitability and liquidity, two different regression equations are incorporated in this research work. Equation 4.1 analyzes the impact of CCC on firms' profitability. While Equation 4.2 assesses the nature of relationship exist between firms' CCC and liquidity. To gauge profitability, researchers use different measures such as net operating profit (Shin and Soenen, 1998; Raheman et al., 2010), gross operating profit (Lazaridis and Tryfonidis, 2006; Gill et al., 2010), return on assets (Padachi, 2006; Teruel and Solano, 2007), and return on investment (Schilling, 1996; Ebben and Johanson, 2011). However, for the purpose of the study under reference, the profitability is measured via return on investment.

The return on investment⁶⁵ is a popular and most widely used measure to assess the performance of an enterprise in terms of profitability (Gibson, 2013). Since, an ultimate sustainability of a business depends upon the returns earned on the invested capital. Equation 4.1 taking return on investment as measure for profitability is developed on the pragmatic research work done by Ebben and Johanson (2011). As Schilling (1996), argues that return on investment is an appropriate measure of profitability when dealing with working capital management. According to Schilling (1996), it is significant to distribute resources among working capital and capital investment as it ultimately ensure optimal liquidity and subsequently the profitability.

Independent variables of Equation 4.1 are cash conversion cycle (CCC), gross working capital turnover ratio (GWCTR), financial debt ratio (FDR), operating cycle (OC), firm size (LOS) and sales growth (SG). Consequently for the purpose of regression analysis, in Equation 4.1 firms' profitability measured by return on investment is modeled as a function of core

⁶⁵ It is used for profitability measure and calculated as Net Income / Interest Bearing Debt and Owner's equity

independent variable of cash conversion cycle in addition to other firm characteristics. General form of Equation 1 is as follows:

$$ROI = f(\text{CCC}, \text{GWCTR}, \text{FDR}, \text{LOS}, \text{SG}, \text{OC}) \dots \text{Equation 4.1}$$

where, Cash Conversion Cycle (CCC) is a vital variable of the study applied as vector of Average Collection Period (ACP), Inventory Turnover in Days (ITID) and Average Payment Period (APP). It is anticipated in the view of the given literature that variable of CCC is inversely related with firms' profitability. Profitability of an enterprise enhanced by reducing two components ACP and ITID of CCC. In addition, the APP component also associated with profitability of firms. Other explanatory variables of Equation 1 that are typically assumed to be related with firms' profitability are GWCTR, FDR, LOS, SG and OC.

Furthermore, inclusion of GWCTR in the Equation 4.1 is due to the reason that it is an activity ratio⁶⁶ and activity ratios reflect the performance of firms in terms of efficiency (Hartgraves, 2007). FDR variable on the other hand symbolizes the leverage and expected to have negative relation with firms' profitability. While, SG variable pronounces the growth chances available to firms and supposedly have a positive impact on profitability. Another variable OC is composed by two components namely trade debts and inventory stock and. Firm size is measured by the natural logarithm of sales and expected to have positive relation with profitability. An explanatory OC variable of Equation 4.1 is later replaced by trade debts, inventory stock and accounts payable and subsequently four models are obtained on which regression analysis is done in later stage of the study.

⁶⁶ Activity ratio basically reflects the firms' efficiency in respect with the utilization of their current resources.

Hence, for the purpose of empirical analysis in the study, following regression models are derived from the Equation 4.1:

Model 1

$$ROI_{it} = \beta_0 + \beta_1(CCC_{it}) + \beta_2(GWCTR_{it}) + \beta_3(FDR_{it}) + \beta_4(LOS_{it}) + \beta_5(SG_{it}) + \beta_6(OC_{it}) + \varepsilon_{it}$$

Model 2

$$ROI_{it} = \beta_0 + \beta_1(CCC_{it}) + \beta_2(GWCTR_{it}) + \beta_3(FDR_{it}) + \beta_4(LOS_{it}) + \beta_5(SG_{it}) + \beta_6(TD_{it}) + \varepsilon_{it}$$

Model 3

$$ROI_{it} = \beta_0 + \beta_1(CCC_{it}) + \beta_2(GWCTR_{it}) + \beta_3(FDR_{it}) + \beta_4(LOS_{it}) + \beta_5(SG_{it}) + \beta_6(IS_{it}) + \varepsilon_{it}$$

Model 4

$$ROI_{it} = \beta_0 + \beta_1(CCC_{it}) + \beta_2(GWCTR_{it}) + \beta_3(FDR_{it}) + \beta_4(LOS_{it}) + \beta_5(SG_{it}) + \beta_6(AP_{it}) + \varepsilon_{it}$$

Table 4.2 Abbreviations and Measurement of Variables of Equation 4.1

Variables	Abbreviation	Measurement
Return on Investment	ROI	Net Income/Interest Bearing Debt and Owner's Equity
Cash Conversion Cycle	CCC	Average Collection Period in Days + Inventory Turnover in Days – Average Payment Period in Days
Gross Working Capital Turnover Ratio	GWCTR	Net sales/Current Assets
Financial Debt Ratio	FDR	(Short Term Loans + Long Term Loans)/Total Assets
Operating Cycle	OC	Trade Debts + Inventory Stock
Firm Size	LOS	Natural Logarithm of Sales

Sales Growth	SG	$(\text{Current Year N. Sales} - \text{Last Year N. Sales}) / \text{Last Year N. Sales}$
Average Collection Period in Days	ACP	$\text{Account Receivable} / \text{Net Sales} * 365 \text{ days}$
Inventory Turnover in Days	ITID	$\text{Inventory} / \text{Cost of Goods Sold} * 365 \text{ days}$
Average Payment Period in Days	APP	$\text{Accounts Payable} / \text{Purchases} * 365$

The table also shows the measurement of key components of CCC: ACP, ITID, APP.

Owolabi (2012) states that after the global financial crisis of 2008, the relevance of liquidity management in the performance of firms becomes more imperative. In order to estimate the impact of CCC on liquidity of listed firms belonging to non financial sector of Pakistan, net balance position is used as measure for liquidity. Unlike the other conventional measure of liquidity, such as quick or current ratios, this study incorporates net balance position. Net balance position (NBP) is selected as measure for liquidity because of its effective way of estimating firm's ability to meet its short term cash expenditure and liabilities than other conventional measures (Johanson et. al., 2004).

Basically, net balance position is an estimate of the cash excess or shortage a firm has after financing its fixed asset and working capital needs. Net balance position is calculated as working capital available less working capital required; working capital required is equal to non-current-interest-bearing debt plus owners' equity less net fixed assets, and working capital available is equal to a minimum cash cushion plus accounts receivable plus inventory less accounts payable (Ebben and Johanson, 2011). Conversely, independent variables include Cash Conversion Cycle (CCC), Asset Turnover (ATO), Current Liabilities to Total Asset Ratio

(CLTAR), Current Asset to Operating Income (CAOI), Financial Debt Ratio (FDR), Firm Size (LOS) and Sales Growth (SG).

To evaluate the effect of CCC on liquidity, the model used for regression analysis is stated in the general form in Equation 4.2.

$$NBP = f(\text{CCC}, \text{ATOR}, \text{CLTAR}, \text{FDR}, \text{LOS}, \text{SG}, \text{CAOI}) \dots \text{Equation 4.2}$$

The key independent variable in above regression equation is CCC which in turn, is composed of three other variables (ACP, ITID and APP). The association between CCC and liquidity is expected to be negative as longer the CCC longer the cash remains blocked in working capital and worsen the level of liquidity (Masson et al., 1995; Padachi, 2006). The regression equation also includes other explanatory variables like ATOR, a financial ratio assumed to be positively related with liquidity, as higher the ATOR means more sales revenue therefore added cash is available to discharge liabilities. Variable of CLTAR included as an independent variable of Equation 4.2 reflects the financing policy of firms whether it is aggressive or conservative, higher ratio indicates aggressive financing policies and vice versa. Additionally, it is assumed to be negatively associated with NBP as higher ratio poses challenge to liquidity (Larson et al., 2005).

Another solvency ratio of FDR is also added to the list of explanatory variables. It represents the leverage and literature suggests a negative association between FDR and liquidity (Majumdar, 1997). Besides, the variables of SG and LOS, a variable of CAOI is also a part of independent variables, it signifies how well the firm used its operating incomes to generate current assets and it is also expected to have a positive relation with liquidity. The variable of CAOI of model 1 is later sequentially substituted by Acid Test Ratio (ATR), Cash Turnover

Ratio (CTR) and Current Assets to Total Assets Ratio (CATA). As a result, four regression models are formed on the basis of general Equation 4.2. These regression models are as follows:

Model 5

$$NBP_{it} = \beta_0 + \beta_1(CCC_{it}) + \beta_2(ATOR_{it}) + \beta_3(CLTAR_{it}) + \beta_4(FDR_{it}) + \beta_5(LOS_{it}) + \beta_6(SG_{it}) + \beta_7(CAOI_{it}) + \varepsilon_{it}$$

Model 6

$$NBP_{it} = \beta_0 + \beta_1(CCC_{it}) + \beta_2(ATOR_{it}) + \beta_3(CLTAR_{it}) + \beta_4(FDR_{it}) + \beta_5(LOS_{it}) + \beta_6(SG_{it}) + \beta_7(ATR_{it}) + \varepsilon_{it}$$

Model 7

$$NBP_{it} = \beta_0 + \beta_1(CCC_{it}) + \beta_2(ATOR_{it}) + \beta_3(CLTAR_{it}) + \beta_4(FDR_{it}) + \beta_5(LOS_{it}) + \beta_6(SG_{it}) + \beta_7(CTR_{it}) + \varepsilon_{it}$$

Model 8

$$NBP_{it} = \beta_0 + \beta_1(CCC_{it}) + \beta_2(ATOR_{it}) + \beta_3(CLTAR_{it}) + \beta_4(FDR_{it}) + \beta_5(LOS_{it}) + \beta_6(SG_{it}) + \beta_7(CATA_{it}) + \varepsilon_{it}$$

Table 4.3: Abbreviations and Measurement of Variables of Equation 4.2

Variables	Abbreviations	Measurement
Net Balance Position	NBP	Working Capital Available –Working Capital Required
Cash Conversion Cycle	CCC	No. of Days Accounts Receivable + No. of Days Inventory–No. of Days Accounts Payable
Asset Turnover Ratio	ATOR	Sales/Total Assets

Current Liabilities Total Asset Ratio	CLTAR	Current Liabilities / Total Assets
Financial Debt Ratio	FDR	(Short Term Loans + Long Term Loans)/ Total Assets
Current Assets to Operating Income	CAOI	Current Assets/Operating Income
Firm Size	LOS	Natural Logarithm of Sales
Sales Growth	SG	(Current Year N. Sales – Last Year N. Sales)/ Last Year N. Sales
Current Assets to Total Asset	CATA	Current Assets/Total Assets
Acid Test Ratio	ATR	(Cash + Accounts receivable + Marketable Securities)/Current Liabilities
Cash Turnover Ratio	CTR	Cash / Sales
Working Capital Available	WCA	(Cash + Accounts Receivable + Inventory) – Accounts Payable
Working Capital Required	WCR	(Interest Bearing Non-Current Debts + Owner’s Equity) – Net Fixed Assets

Above table also shows the measurement of key components of NBP (WCA and WCR) which is used as proxy for liquidity.

4.3 Methodology

The analysis of the present study is based on the panel data of firms from Years 2000-2014. Panel data are the type of dataset which reflects the conduct of entities across time by providing multiple observations (Hsiaq, 2003). These entities stand for individuals, firms, institutions, countries, etc. In the case of this research, entity refers to those firms which are listed at Pakistan Stock Exchange and belongs to non financial sector of Pakistan. The present study examines the effect of CCC on firms’ profitability and liquidity by employing panel data

methodology on the sample set of 387 firms with 3636 observations for the time period of 2000-2014.

Baltagi (2001) states panel data methodology has certain advantages like it assumes that firms are heterogeneous, more variability and less colinearity exists among variables and there exist more information and degree of freedom in data. In other words, it enables to control the unobserved variables like business practices followed by different firms across sectors hence, takes accounts of individual heterogeneity across firms. In multilevel modeling with panel data, suitable variables can be added at different levels of regression analysis (Gelman and Hill, 2007).

In addition, Yafee (2003) suggests that most appropriate test for panel data is one of fixed effect model versus random effect model. Fixed Effect Model (FEM) is used to explain the nature of association between dependent variable (outcome) and independent variable (predictor) within an entity (individual, firm, country etc.). This can be done by evaluating the impact of both predictor and outcome variable that vary over time. An important assumption of FEM states that there exists a correlation between entity's error term and predictor variable. The rationale behind this assumption is that something within the entity could affect the predictor or outcome variable making the either variable biased (Baltagi and Wiley, 2008). FEM resolves the issue of this assumption by removing the impact of those time-invariant characteristics so that the net effect of predictor on outcome variable can be ascertained.

Stock and Watson (2003) emphasize on the key approach of FEM which states that the changes in outcome variable is due to the influence of other than these fixed characteristics only if the unobserved variable does not vary over time. The regression equation of FEM is stated as follows:

$$Y_{it} = \beta_1 X_{it} + \alpha_i + u_{it} \dots\dots\dots \text{Equation 4.3}$$

On the other hand, REM follows the rationale that variables across entities is assumed to be random and uncorrelated with predictor variables. Thus, an advantage of REM is that it includes time invariant variables which are absorbed by the intercept in FEM. REM allows time invariant variables to play a role of explanatory variables since it assumed that entity’s error term is not correlated with the predictor or independent variable. In other way, REM is explained as one in which it is assumed that there is a one common intercept term but individual entity’s intercept varies in random manner from this common intercept. The regression equation for random effect model is described as follows:

$$Y_{it} = \beta X_{it} + \alpha + u_{it} + \varepsilon_{it} \dots\dots\dots \text{Equation 4.4}$$

where, u_{it} is a between–entity error and ε_{it} is within-entity error. Green (2008) defines the difference between FEM and REM in the following words that “the key difference between the FEM and REM is whether the unobserved entity effect represents factors that are correlated with the regressors in the model, not whether these effects are stochastic or not.”

In order to determine which one of these models is more suitable estimator for the regression analysis of the study under consideration; coefficients of all models are obtained and estimates of both fixed effect and random effect are stored. Then with help of Hausman Test, it is determined which model is proved to be more reliable estimator (Padachi, 2006). In other words, validity of models is checked with Hausman test. The null hypothesis of Hausman Test states that the preferred model is random effect as there is no existence of correlation between error term and predictor variables. Whereas, the alternative hypothesis states that fixed effect model is favorable as there is existence of correlation between variables. In more concise manner,

Hausman test verifies whether the error term (u_i) is correlated with the regressors (predictor) or not.

If the probability value of Hausman test is < 0.05 then the null hypothesis is rejected and alternate hypothesis of using FEM is accepted, since in case of existing correlation, FEM gives more consistent results. Otherwise, random effect model will be a better and efficient estimator (Teruel and Solano, 2007). The present study employs fixed effect model framework for the estimation as the probability of Hausman Test in all regression models favors FEM. The results of Hausman test is reported in tables of a following chapter of empirical results.

Chapter 5

Empirical Results

This chapter presents the estimation results, concerning the impact of cash conversion cycle on firms' profitability and liquidity. First, the present study gives the descriptive analysis of all the variables used in this research. This is followed by the Pearson's correlation analysis to identify the association existing between variables of interest in the study. Then the estimated coefficients of different regression models with respect to Equation 1 and Equation 2 are reported.

5.1 Descriptive Statistics and Pearson's Correlation Matrix

5.1.1 Descriptive Statistics

Descriptive statistics explain the main distributive features of panel data related to firms included in this study. It summarizes the large set of data and hence facilitates the quantitative analysis. In Table 5.1 descriptive statistics represent the mean values and standard deviation of variables that are used in empirical models of this research. Apart from that, the table also includes the maximum and the minimum values for each variable so that the extreme values attained by all variables can be traced out.

Table 5.1: Descriptive Statistics of Variables for 387 Non Financial Firms

Descriptive statistics of all dependent and independent variables from 387 firms listed at Pakistan Stock Exchange from non financial sector of Pakistan is given in the table below. The sample period for the data of these variables is 2000-2014. This has given an unbalanced panel dataset of 3636 observations. ROI is a dependent variable used to measure profitability in Equation 4.1 and stands for Return on Investment and NBP another dependent variable used to gauge liquidity in Equation 4.2 stands for Net Balance Position. While all the rest are independent variables. The measurements of all these variables have been explained in Tables 4.1 and 4.2 previously. Values of certain variables like ROI, FDR, CR, CATA, CLTAR, CASR, CTR, CAOI and ATR are expressed in terms of ratios. Whereas, values state against CCC and OC variables are in terms of days in the table below.

Variables	Mean	Standard Deviation	Minimum	Maximum
ROI	0.069	3.493	-65.830	196.180
NBP	3.614	55.815	-200	3176.5
CCC	67.636	169.076	-348.097	982.996
GWCTR	2.871	2.334	0.045	23.456
FDR	0.232	1.156	-2.101	52.481
OC	78.45	101.609	-666.002	88.987
ATR	1.158	2.419	-3.727	4.138
ATOR	2.573	5.788	0.024	20.625
CLTAR	2.984	2.020	0.03	22.020
CATA	0.684	0.392	0.000	4.506
CTR	0.437	1.234	-2.348	6.978
CAOI	2.366	81.751	-81.441	325.053
AP	61.435	98.004	0.000	960.977
TD	39.567	58.278	0.000	730.341
IS	81.345	78.123	0.000	978.543
LOS	7.038	1.965	-2.300	13.620
SG	0.174	0.741	-0.981	16.35

The mean being most important measure of central tendency of data tells the representative sample value of whole dataset (Wilcox, 2001). Standard deviation indicates the dispersion or spread of data from its mean values. Non financial firms on average have 67.63 days of CCC with standard deviation of 169.07. The average firm size measured by logarithm of sales comes to Rs. 7.03 million and annual growth in sales is almost 17%. The mean value of financial debt ratio is 23% which reflects the fact that almost 23% of assets are financed by debt. Return on investment which is used as measure for profitability has annual average of 6.9% with standard deviation of 3.493. Liquidity measure net balance position shows an average value of 3.6 million having standard deviation of 55.86.

On comparing standard deviation of each variable, the standard deviation of CCC and OC variable seems more volatile having a value of 169.07 and 101.609 respectively. On the other hand, lowest variation is observed in CATA variable with standard deviation of 0.392. It implies that firms across industries maintain same level of current assets in respect to their total assets. Relatively high standard deviation for certain variables in table 5.1 reflects two aspects of the dataset. Firstly, the sample firms belong to different industries of non financial sector and each industry has its own unique characteristic and policies. Secondly, some of the variables defined above are expressed in terms of days.

5.1.2 Correlation Matrix Analysis

A correlation matrix is used to determine the association between multiple variables at the similar time period. Tables 5.2 and 5.3 present the correlation matrix of variables included in Equations 4.1 and 4.2 respectively for this analysis. These calculations are based on panel data of 387 non financial firms with 3636 observations for the period of 2000-2014.

Table 5.1 Pearson Correlation Coefficients for Variables of Equation 4.1

Table 5.2 describes the correlation matrix analysis of variables included in Equation 4.1. Equation 4.1 encompasses the first objective⁶⁷ of the study under consideration and attempt to evaluate the impact of cash conversion cycle on profitability of firms. In this equation, profitability is gauged through return on investment (ROI), where ROI is measured as net income / interest bearing debt + owner's equity. ROI in turn is a function of CCC, GWCTR, FDR, OC, LOS and SG. Therefore, the regression equation to assess the impact of CCC on firms' profitability is defined as: $ROI = f(CCC, GWCTR, FDR, OC, LOS, SG)$. Dataset consists of 3636 observations drawn from 387 firms listed at Pakistan Stock exchange for the period of 2000-2014.

	ROI	GWCTR	CCC	FDR	OC	LOS
GWCTR	.701** .000					
CCC	-.072** .000	-.063** .000				
FDR	-.003 .723	.002 .789	-.001 .899			
OC	-.002* .051	.001 .885	.001 .899	.745** 000		
LOS	.039** .007	.003 .799	.027* .051	-.053** .000	-.062** .000	
SG	.013** .003	.004 .784	.013** .005	.020 .168	-.018 .266	.101** .000

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

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

Table 5.2 explains the Pearson correlation for the variables used in regression analysis of Equation 4.1. At the first look, it is evident from the above table that the correlation between main independent variable CCC and dependent variable ROI is inverse and statistically significant. In addition, the sign of the relevant correlation coefficient of CCC is in line with existing literature of Deloof 2003, Appuhami, 2008 and Mathuva 2010. This result supports the argument that firms with shorter CCC are more likely to be profitable than firms with longer CCC (Uyar, 2009). A positive and significant correlation between ROI and GWCTR is reported by the correlation matrix table above.

⁶⁷ To examine the relationship that exists between CCC and profitability of non financial firms.

Further, FDR has a negative and insignificant relationship with ROI, it means more utilization of debt decrease profitability. The negative and significant correlation between OC and ROI indicates that if there is an increase in OC it will have a negative impact on the ROI. While, positive association of LOS and SG variables with the dependent variable ROI is reported in the Table5.4 which implies large firms have higher return on investments (Moss and Stine, 1993).

Table 5.3: Pearson Correlation Coefficients for Variables of Equation 4.2

Table 5.3 presents the correlation matrix analysis related to variables of Equation 4.2 of the present study. Principally, Equation 4.2 describes the second objective⁶⁸ of the study and measures the effect of CCC on firms' liquidity. Here, Net Balance Position (NBP) variable is used as proxy for liquidity. Where, NBP is measured as working capital available – working capital required. Other independent variables include; Cash Conversion Cycle (CCC), Assets Turnover Ratio (ATOR), Current Liabilities Total Asset Ratio (CLTAR), Financial Debt Ratio (FDR), Current Assets Operating Income (CAOI), Logarithm of Sales (LOS), and Sales Growth (SG) where, measurements of all these variables are given in Table 4.3 (Chapter 4). $NBP = f(CCC, ATOR, CLTAR, FDR, SG, LOS, CAOI)$. Sample is drawn from 387 non financial firms listed at Pakistan Stock Exchange from the year 2000 to 2014.

	NBP	CCC	ATOR	CLTAR	FDR	LOS	SG
CCC	-0.248** (0.005)						
ATOR	0.148** (0.002)	0.119** (0.000)					
CLTAR	-0.025* (0.057)	-0.020 (0.356)	0.030 (0.176)				
FDR	-0.001** (0.006)	-0.022 (0.137)	0.183* (0.053)	0.030 (0.171)			
LOS	0.128** (0.000)	0.312** (0.000)	-0.169* (0.055)	0.215** (0.001)	-1.090* (0.050)		
SG	0.135** (0.010)	0.073** (0.001)	-0.201 (0.373)	-0.058** (0.008)	0.040 (0.069)	0.64** (0.004)	
CAOI	0.011 (0.789)	0.678** (0.000)	-0.043 (0.545)	-0.015 (0.922)	0.029 (0.750)	-0.069 (0.659)	0.030 (0.176)

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

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

Table 5.3 represents the correlation analysis of variables defined in Equation 4.2. CCC being an independent variable shows a highly significant and inverse relationship with dependent

⁶⁸ To study the impact of cash conversion cycle on liquidity of firms belong to non financial sector.

variable NBP. Which in turn in line with the existing belief, that shorter length of CCC contribute positively to the availability of net balances in business (Ebben and Johanson, 2011). While the variable of ATOR shows a highly significant and positive correlation with NBP. It reflects the fact that higher turnover contributes positively to the liquidity level. FDR variable in correlation matrix of Table 5.3 illustrates a negative and significant association with NBP. Which in turn implies that when firms increased the utilization of their debt beyond the desired level it affects the liquidity of firms negatively (Jose et al., 1996)

Variables of SG and LOS demonstrate a positive and significant correlation with NBP. This is consistent with the empirical belief that both the firm size (LOS) and chances of further growth (SG) help firms to achieve high level of liquidity. An explanatory variable CLTAR confirms a positive significant correlation with NBP. It explains the relationship between dependent (NBP) and explanatory variable (CLTAR) and suggests that rise in CLTAR leaves unfavorable impact on the level of liquidity of the firms (Amalendu et al., 2011). Lastly, CAOI variable of correlation matrix table reports a positive insignificant association with NBP. It means an increase in CAOI contributes towards better liquidity levels of firms.

In short, correlation matrix analysis presents certain preliminary evidence regarding the relationship exists between dependent and independent variables of empirical models. However, examining this simple bivariate correlation in a conventional matrix does not provide a reliable indicator of association (Padachi, 2006). As correlation matrix analysis does not allow to identify causes from consequences. In order to examine the association or relationship more properly and in detailed estimated coefficients of multivariate models are obtained with fixed effect framework of panel data methodology. Moreover, high correlation between variables also takes into account of regression analysis to avoid the problem of multicollinearity problem.

5.2 Estimation Results

So far, this study established a basic framework of data analysis and literature in order to assess the impact of cash conversion cycle on firms' profitability and liquidity. Now, estimation results of regression analysis are presented to shed more light concerning the effect of CCC on firms' profitability and liquidity. First, the research explores the relationship between CCC and firms' profitability based on regression analysis of Equation 4.1 using panel data methodology. Second, the study measures the impact of CCC on firms' liquidity using regression Equation 4.2 by again employing the panel data methodology.

As discussed earlier in Chapter 4 of this research, a most appropriate conventional test for panel data is one of random effect model versus fixed effect model. Initially, in order to decide which one of these two models is appropriate, regression coefficients are estimated both from fixed and random effect models. Then, Hausman test is employed after saving estimate results of fixed and random effect to choose between the two models. Later, decision is taken to use fixed effect model since the probability (p) value of Hausman test in all models of equation 1 and equation 2 is less than 0.05.

The model incorporated for regression analysis for the first objective of the study stated in general form as given in Equation 1. Independent variable OC is afterwards replaced sequentially by other explanatory variables; TD, IS and AP respectively. Hence four regression models are run and results of fixed effect model are presented in tabular form in Table 5.5. Furthermore, to accomplish the third objective of the study equation 1 is run on the data of different industries belonging to non financial sectors of Pakistan. This is useful in order to determine the behavior of variables across industries. For this rationale, four industry groups are

selected from non financial sector of Pakistan and these groups are as follows: textile, sugar, cement and automobile industries. All these four industries are important contributors either in export earning or gross domestic product of Pakistan (Pakistan Economic Survey, 2014-15).

$$ROI = f(CCC, GWCTR, FDR, LOS, SG, OC) \dots \dots \dots \text{Equation 4.1}$$

Estimation Results: Impact of cash conversion cycle on firms’ profitability.

Table 5.5 presents the results of multivariate regression models in respect to measure the impact of CCC on firms’ profitability. In all four models Return on Investment (dependent variable) is used as measure of profitability in order to verify the effect of CCC on firms’ profitability. While independent variables are; cash conversion cycle, gross working capital turnover ratio, financial debt ratio, logarithm of sales, sales growth, operating cycle, trade debts, inventory stock and accounts payable. Regression analysis is done with the help of panel data methodology in STATA software. Only the results of fixed effect model are reported as Hausman test rejects the null hypothesis of accepting random effect model. An unbalanced annual panel data for the period 2000-2014 is used for the regression analysis. The sample consists of 387 non financial firms listed at Pakistan Stock Exchange with 3636 observations. The data of variables is extracted from financial statements of firms published by State Bank of Pakistan and hence, is a secondary data. *** and ** denote the significance level at the 1% and 5% level of significance respectively.

Table 5.4 Impact of Cash Conversion Cycle on Firms’ Profitability (2000-2014)

Dependent Variable:	Return on Investment			
Regression Model	Fixed Effect Model			
Model	(1) OC	(2) TD	(3) IS	(4) AP
Constant	-0.4186*** (0.000)	-0.2040*** (0.003)	-0.2069*** (0.001)	-0.2086*** (0.002)
CCC	-2.7402*** (0.001)	-2.9670*** (0.002)	-3.4282*** (0.004)	-2.3261*** (0.000)
GWCTR	0.4936*** (0.000)	0.5415*** (0.000)	0.5314*** (0.000)	0.5017*** (0.000)
FDR	-0.0263 (0.231)	-0.0116 (0.541)	-0.0117 (0.539)	-0.0267 (0.497)
LOS	0.0301*** (0.017)	0.0049 (0.123)	0.0038 (0.056)	0.0031 (0.571)
SG	0.0398*** (0.000)	0.0398*** (0.004)	0.0381*** (0.005)	0.0211*** (0.000)

OC	-1.0051** (0.052)	-	-	-
TD	-	-1.6780*** (0.000)	-	-
IS	-	-	-2.8341** (0.051)	-
AP	-	-	-	1.6978** (0.055)
R-Square	0.4906	0.5318	0.5067	0.5418
Adjusted R-Square	0.4896	0.5311	0.4997	0.5396
Prob (F statistics)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Hausman Test	(0.0076)	(0.0058)	(0.0051)	(0.0050)

The *P-Values* are shown in parentheses.

The foremost objective of this study is to access the impact of cash conversion cycle on firms' profitability measured by the return on investment. Estimation results of Table 5.5 demonstrate that the cash conversion cycle (CCC) in all four models has a significant and negative impact on firms' profitability, measured by return on investment (ROI). It implies profitability is inversely associated with CCC. This result supports the notion that shortening the length of CCC by reducing the time that cash is tied up in working capital and by speeding up the collections results in high profitability (Nobanee et al., 2011; Mathuva, 2010; Deloof, 2003).

This negative relationship can also be explained by the fact that minimizing the investment in current assets (accounts receivable turnover in days) contributes positively in boosting profits (Lazaridis and Tryfonidis, 2000; Shah and Soenen, 1998). This further, ensures that liquid cash if not maintained in business for too long, can be used for more profit generation (Karaduman, 2010). Another possible explanation of the above findings is that when the CCC is relatively shorter, the firm may not need external financing, which reduce the interest expense and borrowing cost, therefore profitability is enhanced (Uyar, 2009).

Since, CCC is composed of three key elements of working capital (ACP, ITID and APP) consequently the short length of CCC refers to three important aspects related to profitability. Firstly, by reducing an Average Collection Period (ACP) firms ensure the speedy collection from their customers which in turn leave a positive impact on firms' profitability as more cash is available for further investment (Nejad et al., 2013). It also reflects the efficiency of management in regard to its collection policy as more the efficiency lesser would be chances of bad debts (Dinku, 2014). Secondly, by decreasing Inventory Turnover in Days (ITID) means more inventory is converted into sale in lesser period of time. It means there is more opportunity to generate higher sales in shorter period of time and thus higher profitability can be achieved in shorter span of time (Rehaman et al., 2010). Although, high ITID minimizes the risk of bottlenecks during production process but this is at the holding cost of inventory. A Higher level of inventory and debtors implies higher carrying and holding cost which has a direct impact on profitability. Thirdly, by increasing average payment period (APP) refers to the idea that by delaying payment to creditors enables the business firms to maintain higher level of reserves in working capital that can be used to enhance profitability (Tahir and Anuar, 2015).

Findings of Model 2, 3 and 4 have further asserted the previous argument that CCC has an inverse and significant relationship with profitability. Given that, coefficients of CCC variable reported a negative and significant relationship with ROI in all these models. It implies that CCC being an important measure of working capital affects the profitability inversely. Further, in Model 2, TD variable indicates a negative and significant association with ROI. It means that if trade debts show for longer period of time and are not collected from customers it decrease the profitability of firms in terms of cash (Gill et al., 2010).

In Model 3, regression coefficient of IS reflects a negative significant relationship with ROI which means profitability increases by keeping the inventory for lesser period of time. Even though, high inventory reduces the chances of stock outs but it also diminishes the opportunity to avail the lesser purchase cost price of an inventory (raw material). In other way, high inventory (finished goods) sometimes poses serious problems to sales resulting in low profitability. Results of Model 4 indicate a positive significant association between AP and ROI; this indeed does make a sense, since longer the firm delays its payment higher is the cash reserves. In other words, by delaying payments to creditors enable the firm to maintain higher level of working capital reserves which in turn uses for more investment and profitability (Mathuva, 2010).

The findings also epitomize a highly significant positive association between GWCTR and ROI in all four models. It reveals that the firms' efficiency to deploy its current assets in sales generation leaves positive impact on firms' profitability (Larson et al., 2005). This postulate seems true as more efficiently the firm uses its current resources to produce sales more profitability is expected as a result. Furthermore, there exists a negative and insignificant relationship between financial debt ratio (FDR) and ROI in all models. It means that increase in debt is escorted with decline in profits, which suggest that firms bearing high leverage are softer competitors which curtail the investments (Myers, 2003). Hence, the insufficient ability of competition diminishes the profitability (Samilogu and Dermigunes, 2008). This result can be elaborated from the conservative working capital approach that employs long-term sources in financing short term working capital. Hence increase the interest expense the theory of term premium says that the long-term funds have higher interest rate compared to short-term funds as risk perception and uncertainty is high in case of longer terms.

As far as the matter of insignificance exists in this relationship, Ebaid (2009) states that decision regarding capital structure choice has a weak impact on firms' performance.

The natural logarithm of sales (LOS) used for firm size is positively related with ROI in all four models. This implies that larger firms have favorable impact on general level of profitability (Raheman and Nasr, 2007). Even though, the significance of this relationship fluctuates in all four models of the study. This variation is because of the fact that dataset belongs to firms from different industry groups. Mathuva (2010) states, that larger firms normally reports higher profits because of their ability to exploit their economies of scale. Another, variable of sales growth (SG) exhibits a positive and statistically significant association with ROI in all the regression models of Table 5.5. Positive and significant association between SG and ROI specifies that growth in sales leads to an increase in profitability (Charitou, 2010). As firms increasing sales means increasing profitability in terms of both cash and receivables. Besides, SG is also a vital indicator of firms' business prospects, thus allowing firms to enjoy improved profitability via higher sales (Teruel and Solano, 2007).

Another variable Operating Cycle (OC) portrays an inverse significant result with ROI, which means that an increase in the OC is allied with decrease of ROI. Since operating cycle provides information for the business about how long it takes to make and sell finished products. Hence, the result can be explained that a longer OC leads to high carrying cost of inventory which later affects the profitability in a negative direction. This finding is in line with the earlier study conducted by Ching et al (2011).

Table 5.5: Impact of Cash Conversion Cycle on Firms' Profitability (2000-2014) with Respect to Different Industry Groups

To examine the impact of cash conversion cycle on firms' profitability in accordance with the nature of the business carried by the firms of nonfinancial sector, the following regression model is incorporated.

$$ROI_{it} = \beta_0 + \beta_1 (CCC_{it}) + \beta_2 (GWCTR) + \beta_3 (FDR_{it}) + \beta_4 (LOS_{it}) + \beta_5 (SG_{it}) + \beta_6 (OC_{it}) + \varepsilon_{it}$$

The time-dimension of panel data used in this regression estimation runs yearly from 2000-2014 with the dataset cover 170 firms from textile sector with 1396 observations, 32 firms with 355 observations from sugar sector, 35 firms having 162 observations from cement sector and 41 automobile firms with 323 observations. The selection criteria of industries are previously mentioned in data collection chapter. All these firms selected for analysis is listed at Pakistan Stock Exchange. *** and ** denote the significance level at the 1% and 5% level of significance respectively.

Dependent Variable	ROI	Full Sample Size	Textile Sector	Sugar Sector	Cement Sector	Automobile Sector
Independent variables	CCC	-2.7402*** (0.001)	-2.1432** (0.051)	-2.5206** (0.053)	-1.0880*** (0.001)	-0.0567*** (0.005)
	GWCTR	0.4936*** (0.000)	0.4728*** (0.000)	0.4966*** (0.000)	0.7219*** (0.000)	0.5679*** (0.002)
	FDR	-0.0263 (0.231)	-0.1307*** (0.008)	-0.0290 (0.167)	-0.0588 (0.401)	-0.1114 (0.533)
	LOS	0.0301*** (0.017)	0.0125*** (0.000)	0.0304*** (0.014)	0.0239*** (0.017)	0.0125** (0.021)
	SG	0.0398*** (0.000)	0.0062*** (0.001)	0.0080*** (0.000)	0.0091*** (0.001)	0.0251** (0.025)
	OC	-0.0051** (0.052)	-0.0012 (0.090)	-0.0033 (0.176)	-0.0247 (0.412)	-0.0116 (0.488)
	CONSTANT	-0.4186 (0.000)	-0.1803 (0.007)	-0.3129 (0.027)	-0.2455 (0.001)	-0.1907 (0.001)
	R-Square	0.4906	0.2868	0.2213	0.1928	0.2034
	Adjusted R-Square	0.4896	0.2846	0.2113	0.1809	0.1943
	Prob (F statistics)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	Hausman Test	(0.0076)	(0.0025)	(0.0017)	(0.0003)	(0.0053)

The *P-Values* are shown in parentheses.

Even though, Table 5.5 illustrates a detail account of the nature of relationship that exists between firms' CCC and profitability measured through ROI. But in order to accomplish the third objective of the study, there is still a need to check this relationship across different industries. Table 5.6 reports the regression results in order to evaluate the impact of CCC on profitability measured through ROI with respect to different industry groups. The findings exemplify that CCC is inversely associated with ROI although the significance of this association varies from industry to industry. This refers to the idea that reducing CCC

contributes positively towards profits generation (Teruel and Solano, 2007). A strong inverse association can be seen in cement and automobile industries with p values of (0.001) and (0.005) respectively. On the other hand, textile industry has a p value (0.053) and sugar industry has shown p value of (0.053) accordingly. The reason of this difference is high competitiveness in sugar and textile sector. Sometimes firms in order to increase their market share of sales give generous trade credits which in turn prolongs their CCC, as a result profitability increases but at the expense of liquidity (Enqvist, 2014).

Moreover, the regression results observe a positive and significant relationship between GWCTR and ROI in all industry groups. It signifies towards the common belief that higher turnover of gross working capital contributes towards the better profitability of the firms, irrespective to the nature of business in which firms are engaged (Boisjoly, 2009). When firms more efficiently utilized their working capital resources, it enhances their performances which ultimately prove beneficial for earning profits.

By discerning at the empirical results, there exists an inverse insignificant association between FDR and ROI in all industries except the textile industry. It indicates two aspects; first, it confirms the fact that an increase in FDR declines profitability due to interest expense on borrowed capital and augmented risk of default. This finding is consistent with preceding results of Padachi, (2006) and Deloof (2003). Secondly, textile industry shows exception because it is dominated by family controlled business with capital structure dominated by debt to understate profitability in order to avoid government taxes (Tahir and Anuar, 2015). This result can also be explained that the cost of interest is low when firms make maximum usage of their short term internal finances. There are two reasons for this: firstly, the rate of interest is cheaper and secondly, in the off seasons, the loan can be repaid and hence, no idle funds (Keown et al.,

2003). In real terms it actually reflects the aggressive working capital approach adopted by firms whereby, the task of working capital manager is to smoothly run the operating cycle of the company with the lowest level of working capital.

In addition, the coefficient of OC displays an insignificant and negative relationship with ROI in all industries. This implies that firms with relatively smaller OC are more profitable. Moreover, by shortening the OC to escalate the efficiency of working capital management results in increasing operating profitability (Mathuva, 2010). Regression results of different industries reveal that there exists a strong significant and positive association between SG and ROI. This entails that SG has a positive and strong relation with measures of profitability as it reflects the market share of the firms in terms of sales (Shin and Soneon, 1998). LOS used for firm size in regression models of this research shows a positive significant relationship with ROI across the four industries. This signifies the fact that large firm size favors higher profits because better bargaining power of large firms helps firms to dominate markets and nature of business is irrelevant in this case (Ebben and Johanson, 2011).

Another important objective of the study is to examine the impact of CCC on firms' liquidity. For this purpose, net balance position is used to gauge the liquidity of the firms unlike the traditional measures of liquidity, such as current ratio and acid test ratio. Regression analysis is done to check the association of CCC and liquidity of firms on four regression models derived from Equation 4.2 stated as follows:

$$NBP = f(\text{CCC}, \text{ATOR}, \text{CLTAR}, \text{FDR}, \text{LOS}, \text{SG}, \text{CAOI}) \dots \dots \dots \text{Equation 4.2}$$

Estimation Results: Impact of Cash conversion Cycle on Firms' Liquidity (2000-2014)

To accomplish the second key objective of the study net balance position is used as measure of liquidity and effect of CCC on firms' liquidity is assessed through fixed effect model framework. Again, multivariate models are

derived from Equation 4.2 as described previously. NBP is measured as working capital required – working capital available. The key independent variable is CCC and other explanatory variables include; asset turnover ratio, current liabilities to total asset ratio, financial debt ratio, firm size, sales growth, current assets to operating income, acid test ratio, cash turnover ratio and current assets to total assets ratio. The measurements and abbreviations of these variables are given in Table 4.3 of Chapter 4. Besides, the R-square, Adjusted R- square and probability value of F-statistics, probability of Hausman Test is also given in this table.*** and ** denote the significance level at the 1% and 5% level of significance respectively.

Table 5.6: Impact of Cash conversion Cycle on Firms' Liquidity (2000-2014)

Dependent Variable:	Net Balance Position			
Regression Model	Fixed Effect Model			
Model	(5) CAOI	(6) ATR	(7) CTR	(8) CATA
Constant	-0.2065*** (0.000)	-0.1807*** (0.001)	-(0.2107)*** (0.000)	-0.1967 (0.005)
CCC	-1.5025*** (0.000)	-1.7893*** (0.000)	-2.0786*** (0.007)	-2.1081*** (0.008)
ATOR	0.0036 (0.345)	0.0027 (0.067)	0.0026 (0.451)	0.0022 (0.154)
CLTAR	-0.0245*** (0.001)	-0.0298*** (0.002)	-0.0371*** (0.005)	-0.0257*** (0.000)
FDR	-0.0036** (0.051)	-0.0035** (0.056)	-0.0033 (0.067)	-0.0037** (0.055)
LOS	1.5023*** (0.000)	1.2649*** (0.000)	1.4119*** (0.000)	1.4016*** (0.000)
SG	0.0109*** (0.004)	0.0112*** (0.002)	0.0100*** (0.003)	0.0101*** (0.005)
CAOI	1.7823*** (0.006)	-	-	-
ATR	-	0.4857*** (0.000)	-	-
CTR	-	-	0.0398** (0.051)	-
CATA	-	-	-	0.679*** (0.000)
R-Square	0.4896	0.5218	0.5615	0.5124
Adjusted R-Square	0.4886	0.5011	0.5576	0.4987
Prob (F statistics)	(0.0000)	(0.0000)	(0.0000)	(0.000)
Hausman Test	(0.0268)	(0.0293)	(0.0541)	(0.0537)

The *P-Values* are shown in parentheses

Table 5.7 elaborates the details of coefficients obtained from four regression models, which are specified to evaluate the impact of CCC on liquidity of firms in Pakistan. The empirical results inform that the length of CCC is not only inversely but also significantly associated with NBP in all four regression models. It further specifies that liquidity of firms improves significantly by minimizing the length of CCC, as improved balances (NBP) make it possible for firms to discharge their liabilities as they fall due. This finding is also in line with the studies previously conducted by Jose et al., (1996); Lyroudi and Tryfonidis (2000) and Charitou (2010).

In fact, shorter CCC as discussed earlier ensures the availability of cash in the operating period of business. In other words, when the CCC is relatively shorter, the cash in hand position of firms is ideal to pay off their liabilities or debts (Melicher and Norton, 2010). Moreover, firms do not need any external financing for their short term obligations which in return decreases interest expense (Karaduman, 2011) and hence liquidity position remains intact. This postulate can also be explained from the definitions of three components of CCC (ACP, ITID, and APP). By keeping the ACP shorter actually helps entities to improve cash balances in current period within an entity as a result enough cash is available to discharge the obligations and for the payment of expenses.

In addition, if the APP to suppliers and creditors is prolonged, cash remains with business for longer period of time and therefore can be employed to improve the liquidity position of firms. Basically, it is a management of cash inflow (ACP) and cash outflow (APP) in an optimum manner so that the liquidity of firms does not suffer (Owolabi et al., 2012). Since, CCC is time lapse between this inflow and outflow, so it needs to be managed well so that favorable impact of CCC on liquidity can be ensured.

Muller (2003) suggests that inventory management plays a key role in success of firms, by maintaining an optimum level of ITID firm can enhance the current balances. Indirectly, it reflects that lesser time taken by an inventory to turn into sales contributes positively to liquidity position of firms. As sales generate current assets (cash, accounts receivable), less period of ITID complements the liquidity position of firms.

The findings further illustrate that ATOR is positively related with NBP in all four regression models provided that the significance level varies from model to model. ATOR represents the ability of a firm to make use of its total assets in sales generation hence, has a positive relationship with liquidity. As far as variation in significance level is concerned, it is due to the reason that mostly sales are not on cash basis but on credit. Another variable CLTAR has inverse significant relationship with NBP; it shows an increase in CLTAR that deteriorates liquidity position (Howorth, 2003). This is true because higher value of this ratio indicates more aggressive financing policy of firm. Madura and Gitman (2000) states that aggressive financing policy means that percentage of firms assets financed from current liabilities is high, consequently net balance position declines and chances of technical insolvency rises.

This aggressive financing strategy poses high level of insolvency risk because the permanent assets are financed by the short-term financing sources (Jordan, 2003). To maintain those permanent assets, the firm would need to be repeated refinancing and renewals. It is not necessary that all the time the refinancing is smooth. For any reason, if the financial institution rejects the renewal, the firm will not be in a position to maintain those permanent assets and will have to forcibly sell them. If failed in realizing those assets, the only option left is liquidation. Liquidating the permanent working capital is very difficult as it consists of accounts receivables and inventory (Farris and Hutchison, 2002).

Table 5.7 also explains that coefficients of FDR are inversely associated with NBP in all regression models and strength of this inverse relationship is also significant, except in the Model 3. Increase in FDR not just increases the amount of capital borrowed but also the interest expense related to that capital which in turn diminishes the NBP, hence the liquidity suffers. This verdict is again in line with previous studies of Deloof (2003) and Lazaridis and Tryfonidis (2006). Basically, FDR is a leverage ratio that reflects the percentage of assets financed from debt and higher FDR means more interest expense less NBP coupled with higher cost of debt. Hence, liquidity suffers with increase in FDR due to the payment of an additional cost (interest expense) on borrowed finance.

Empirical findings in Table 5.7 further state a significant positive relationship among NBP and two other explanatory variables; LOS and SG in all four models. It suggests that both firm size measured by LOS and growth opportunity measured through SG has positive impact on liquidity of firms. Ebben and Johanson (2011) argue that larger size of the firms favors better bargaining powers for firms in respect to trade debts and trade credits as a result firm's liquidity position remains stable. Similarly, SG has a positive effect on liquidity as more SG implies more market share in terms of sales and higher sales are associated with more revenue in terms of cash.

Furthermore, the regression coefficient of CAOI is positively and significantly related with NBP in Model 5 as per reported in this table. The possible explanation of this positive relationship is that if more operating income invested back in current assets better would be the liquidity position. Likewise, the variable ATR in Model 6 exhibits a positive and significant association with NBP. Mainly, ATR represents ratio of most liquid assets owned by the firms,

those assets improve the NBP hence complement the liquidity in terms of liquid assets (Ittelson, 2009).

In Model 6, variable of CTR portrays a positive significant impact on NBP, which expresses the notion that increase in CTR has positive impact on liquidity. Principally, CTR stands for frequency of firms' cash account replacement through the revenue generated from sales. Higher CTR reflects that firm is going through its CCC more quickly, thus cash is used efficiently to generate additional returns rather remains idle. Therefore, better use of cash helps to generate more cash and improves liquidity position (Ainsworth and Deines, 2016). Lastly, CATA variable indicates a positive and statistically significant association with NBP. It means that increase in CATA makes liquidity position better because CATA represents the amount of total assets occupied by the current assets in firms. Ray (2014) asserts that higher CATA is effectively involved in improving liquidity as it is an essential part of working capital required for the net balance position.

Table 5.7: Impact of Cash Conversion Cycle on Firms' Liquidity with Respect to Different Industry Groups

Table 5.6 states the results regarding the effects of CCC on firms' liquidity in accordance with the different industry groups. For the purpose of this objective, study classified four industry groups from non financial sector of Pakistan. These industry groups include; textile, sugar, cement and automobile industries. Dataset is constructed on the sample drawn from 170 listed firms with 1354 observations from textile industry, 32 listed firms with 345 observations from sugar industry, 35 listed firms from 143 observations from cement industry and 41 listed firms with 307 observations from automobile industry. Regression Model derived from Equation 4.2 runs on panel data of all four sectors and estimated coefficients from fixed effect model framework are reported in tabular form in table below. *** and ** denote the significance level at the 1% and 5% level of significance respectively. Regression Model derived from Equation 2 is specified as follows:

$$NBP_{it} = \beta_0 + \beta_1 (CCC_{it}) + \beta_2 (ATOR_{it}) + \beta_3 (CLTAR_{it}) + \beta_4 (FDR_{it}) + \beta_5 (LOS_{it}) + \beta_6 (SG_{it}) + \beta_7 (CAOI_{it}) + \varepsilon_{it}$$

Dependent Variable	NBP	Full Sample Size	Textile Sector	Cement Sector	Sugar Sector	Automobile Sector
Independent	CCC	-1.5025*** (0.000)	-1.0198** (0.051)	-0.0311*** (0.009)	-0.0037*** (0.007)	-0.0784** (0.054)
	ATOR	0.0036	0.0016	0.0010	0.0011	0.0013

		(0.345)	(0.216)	(0.141)	(0.153)	(0.188)
	CLTAR	-0.0245***	-0.0166**	-0.0131**	-0.0119**	-0.0108**
		(0.045)	(0.054)	(0.050)	(0.050)	(0.056)
	FDR	-0.0036**	-0.0014**	-0.0001***	-0.0002***	0.0001***
		(0.051)	(0.046)	(0.009)	(0.004)	(0.005)
	LOS	1.5023***	1.0259***	0.0983***	0.0765**	0.0456***
		(0.000)	(0.000)	(0.000)	(0.051)	(0.015)
	SG	0.0109***	0.0439***	0.0038***	0.0022***	0.0081***
		(0.004)	(0.000)	(0.005)	(0.006)	(0.051)
	CAOI	1.7823***	0.5345**	0.0032**	0.0044	0.0012**
		(0.006)	(0.056)	(0.057)	(0.065)	(0.050)
	CONSTANT	-0.2065	-0.1877	-0.1228	-0.1098	-0.1027
		(0.000)	(0.000)	(0.005)	(0.051)	(0.007)
	R-Square	0.4896	0.3788	0.2784	0.2678	0.2719
	Adjusted R-Square	0.4886	0.3616	0.2612	0.2501	0.2605
	Prob (F statistics)	(0.0000)	(0.0001)	(0.0005)	(0.0056)	(0.0037)
	Hausman Test	(0.0009)	(0.0209)	(0.0051)	(0.0504)	(0.0566)

The *P-Values* are shown in parentheses.

Table 5.8 of the current study defines the impact of CCC on firm's liquidity with respect to nature of business in which firms are engaged. According to the coefficients declared in the above table, CCC as a key variable exhibits an inverse and significant relationship with NBP in all industries. This result is consistent with the view that shorter length of CCC ensures the liquidity position of firms (Ebben and Johanson, 2011), irrespective to the nature of business carried by the firms (Nobanee et al., 2011). The findings also indicate that even though the coefficient sign of CCC remains same in all industries the significance level does not remain same across the industries. The variation in the strength of association across industries implies that peculiar nature of business defines the liquidity needs of firms.

In addition, there exists a positive but insignificant relationship between ATOR and NBP in all type of industries. The nature of this relationship tells that even though increase in ATOR enhances liquidity of the firms but the impact is not significant in real terms. Conversely, coefficients of CLTAR report a negative and significant association with NBP in all types of

industries. It implies that liquidity position declines with an increase in CLTAR and this is consistent with the previous study conducted by Wang (2002).

Findings of regression analysis across industries reveal that an inverse and significant relationship exists between FDR and NBP. It discloses that liquidity suffers due to increase in FDR. In fact, for the last few years, textile industry faces high interest rate (13.25%) as compared to its regional competitors as a result interest expense increases (APTMA). This increase in interest expense augments the requirement of working capital and hence the liquidity position deteriorates. Moreover, cement sector increases its production capacity and raises almost \$1 billion of finance from both equity and debt. It definitely increases cash outflows under the interest expense head on borrowed capital hence the liquidity position of the firms in cement industry suffers. In brief, there is no major deviation in the results regarding the relationship between FDR and NBP in different industry groups.

Results of Table 5.8 further disclose that explanatory variables LOS and SG are positively and significantly related with dependent variable NBP. Moreover, this relationship with same strength of significance prevails across the industries. It indicates that firm size and growth both contributes positively in firms' liquidity position irrespective of the nature of business carried by the firms (teruel and Solano, 2007; Attari and Raza, 2012). Further, the association between CAOI and NBP reports positive coefficients across industries in the results. It signifies that increase in CAOI affiliates with an increase in liquidity position of the firms regardless to the nature of business.

Chapter 6

Conclusion

6.1 Introduction

The efficient utilization of a firm's resources is very vital as most of the firms invested large amount of their cash in working capital. In order to access the ability of a firm with respect to management of its working capital, cash conversion cycle is considered as an effective and powerful measure. The present research empirically investigates the impact of cash conversion cycle on firms' profitability and liquidity in case of Pakistan. The study hypothesizes that length of cash conversion cycle is inversely and significantly related with a firm's profitability and liquidity position. Analysis of the current study is based on the panel data of 387 nonfinancial firms listed at Pakistan Stock Exchange for the period of time 2000-2014. For the purpose of an in-depth analysis empirical results are obtained by using a panel data methodology.

6.2 Key Findings

The results hence reported by the multivariate regression analysis of the study indicate that the length of cash conversion cycle is inversely and significantly associated with firms' profitability. Additionally, this association remains the same across the industries that operate in nonfinancial sector of Pakistan. In other words, the nature of business has no or less impact on the working capital management in firms. Further, the large size and growth opportunities available to firms enhance the profitability, irrespective of the nature of business in which firms

are operating. Moreover, gross working capital turnover ratio has a positive impact on profitability contrary to financial debt ratio, which has a negative impact on a firms' profitability.

In addition, the study signifies a negative and statistically significant association between the firms' liquidity and the length of cash conversion cycle. As far as the different industry groups of the study are concerned, an inverse and significant association is reported between the length of cash conversion cycle and liquidity of the firms. The results of the study further reveal that current liabilities to total assets ratio is negatively and significantly associated with liquidity. On the other hand, asset turnover ratio is related to firms' liquidity in positive and insignificant manner. Empirical analysis also indicates that financial debt ratio inversely and significantly related to firm's liquidity and this relationship is observed same across different industry groups of the study. Lastly, the firm's size and growth chances play decisive and positive role in better position of liquidity across various group of industries.

6.3 Policy Recommendations

Present study attempts to contribute in the existing literature and research regarding the cash conversion cycle and its impact on firms' profitability and liquidity. Results of the current study suggest many policy recommendations that are beneficial for firms' management. The foremost policy suggestion refers to the fact that currently firms in Pakistan need to focus more on their cash conversion cycle. Since shorter length of this cycle ensures more cash availability to firms, consequently firms' liquidity position remains intact. In addition, this cash enables the firms to avail the investment opportunities in the market which in turn enhances the profitability of firms.

Moreover, cash conversion cycle is an effective tool in the hands of management with respect to working capital management. The credit and payment policy of firms under study needs to be reviewed in order to get an optimum benefit from these components of cash conversion cycle. It is asserted in the study that firms need to accelerate their collection (ACPID) and slow down their payments (APP) and this purpose is best served if firms hire an efficient and thorough professional team of management. The results of the study further indicate that management can derive an optimum advantage by maintaining a right quantity of an inventory.

Another important implication of the study advocates that cash is a scarce resource in the economy and every stakeholder intends to make an optimal use of this resource. The timely availability of this scarce resource (cash) is only possible, if management deals with each component of cash conversion cycle individually and effectively formulates policy in this regard.

6.4 Future Directions

The future avenue of research is that the same study can be conducted in the context of financial institutions. As the stated relationship among cash conversion cycle, profitability and liquidity may differ in case of financial institutions like banks, insurance firms & etc. In financial institutions current assets in the form of cash are more important and required to be maintained in abundance. Therefore, it is significant to analyze the impact of cash conversion cycle on profitability and liquidity of financial firms. Further, the research can be extended to examine the association between cash conversion cycle and profitability in the time period before and after the financial crisis both in case of financial and non financial firms.

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Impact of Cash Conversion Cycle on Firm Profitability and

Liquidity: Some Evidence from Pakistan

**Report Regarding the Incorporation of Comments and Required
Corrections**

S.No.	Comments	Response
1.	Discuss aggressive and conservative financing policy in context of results.	Discussion is incorporated on page # 67, 68, 69, 71, 72 &75.
2.	Clearly distinguish between cash conversion cycle and operating cycle of business.	Distinction between cash conversion and operating cycle is given on page # 10, 11 & 68.
3.	Clearly define measurements used for net balance position variable.	Detail of measurements given on page # 50 & 53.
4.	Correction in Table 5.1 is required.	Correction is made in Table 5.1 on page # 59.