

The determinants of working capital management in Pakistan: The case of manufacturing sector

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ABSTRACT

This study aims at exploring the determinants of working capital management in manufacturing sector listed at Pakistan Stock Exchange (PSE). It has considered all the components of working capital management i.e, cash conversion cycle, average collection period, average payment period and inventory turnover in days. The analysis has been done by utilizing data of 127 Pakistan stock exchange listed firms from four largest industries in Pakistan i.e., textile, sugar, chemical and cement for the period between 2008 and 2013. Hausman results demonstrate that Liquidity, Leverage and Sales growth, Firm age, Operating cash flow are significant determinants of working capital management. In addition, the macroeconomic conditions like GDP and financial crisis also affect the components of working capital management.

Key Words: Working capital management, manufacturing industry, Pakistan

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INTRODUCTION OF THE STUDY

Research studies have given more importance to the investigation of long run financial decisions like capital structure, dividend policies, fixed investment and corporate valuation. (Nazir&Afza, 2009; Lukkari, 2011). However careful analysis of current assets and liabilities is necessary since significant portion of firm's balance sheet consists of short term assets and liabilities (Garcia & Solano, 2010). Current recession in world economy has enhanced the importance of investment in short term financial securities and decisions related to short term financial management particularly in Working Capital Management (WCM) (Lukkari, 2011).

Working capital management is most essential part of short term financial management, considering that one of the important decisions taken by a firm are based on cash, accounts receivable, accounts payable and inventory management as well as it directly affect the firm's performance and risk and hence firm's value (de Almeida & Eid Jr., 2013). A well-managed working capital increases the profitability of the firm; if there is only required investment in the working capital, the excessive funds are available for investment in other profitable projects. The efficient WCM ensures that there is enough liquidity to meet the short term obligations and operating expenses, which saves a firm from liquidity crisis and risk of being defaulter. The increasing growth rates and profitability definitely enhance the share value of the firm (Appuhami, 2008; Smith, 1980). In brief, a firm cannot save itself from liquidity problems as well increase profitability and firm value without efficient management of working capital.

Working capital measures the firm's operational liquidity and as it is associated with operational capital, therefore efficient management of working capital is very critical for a firm (Zariyawati et al., 2016). Previously, research studies have given more importance to the investigation of long run financial decisions like capital structure, dividend policies, fixed investment and corporate valuation. (Nazir&Afza, 2009; Lukkari, 2011). However careful analysis of current assets and liabilities is necessary since significant portion of firm's balance sheet consists of short term assets and liabilities (Garcia & Solano, 2012). Current recession in world economy has enhanced the importance of investment in short term financial securities and decisions related to short term financial management particularly in Working capital management (Lukkari, 2011).

Although working capital management is essential to all organizations but it has more importance for firms operating in developing countries like Pakistan. The fact is that the firms operating in emerging markets are mostly small in size and they have limited access to external resources. These firms mostly rely on trade credit to meet their short term investment needs in cash, accounts receivable and inventories (Chittenden et al, 1998). However, it is also observed that small firms have high failure rate than large firms (Lazaridis & Tryfonidis, 2006). Previous literature indicates that weak financial management, most importantly poor management of working capital is major factor of

failure among small firms. In developing economies, there is also a problem of unskilled workers which is basic need for efficient management of working capital. High interest rates and old technology increases the production and transaction costs which creates hurdles for meeting customer demands in time as well as at cheap prices (Iftikhar, 2013). Proper management of working capital is even more important for firms working in emerging economies like Pakistan to get highest profits.

The purpose of present study is to investigate the determinants of working capital management in manufacturing sector listed at Pakistan stock exchange over the period of 2008 to 2013. The study also considers the association of firm specific as well as macroeconomic factors (GDP and Financial crisis) with working capital management.

LITERATURE REVIEW

The aim of working capital management is to ensure the effective capital flow by passing through current assets and current liabilities. It has lately gained importance after the realization of managers that a firm can get the benefits through efficient management of working capital. Overall, there are fewer studies given on working capital management in academic literature. Capital budgeting, Capital structure are widely studied areas in finance and has gained more importance from researchers (Chiou et al, 2006). In the last decade, it has been extensively studied topic and has been a common interest not only for managers but also for academic researchers.

The relationship between working capital management and firm's performance is widely studied topic in the area of WCM (Deloof, 2003 and Sen & Oruc, 2009). The concluding results for most of studies are that WCM is negatively related with CCC, ACP and ITID while positive relationship found between WCM and APP. The companies can increase performance by efficient management of working capital i.e., by shortening CCC, ACP and ITID and increasing APP to an optimum level.

An important aspect of studying working capital is the policies regarding WCM. An efficient management of cash, accounts receivables, inventories and accounts payables is responsible for success of any business. Nazir and Afza (2009) examined the effect of aggressive and conservative working capital policies on performance of 263 firms from 17 different industries listed in KSE. The study suggested that, the firms, which follow aggressive working capital policies, show low returns than others. Moreover, industries show stable differences from each other in the context of working capital financing and investment policies. To investigate the relationship between WCM policies and performance during global slowdown period, Chaklader and Shrivastava (2013) conducted a study by utilizing

data of manufacturing firms listed in Bombay Stock exchange. Results indicate that WCM has significant effect on performance and firms follow aggressive working capital policies and remained risk averse.

Another area of research regarding WCM is factors determining WCM. Chiou et al (2006) provided insights about determining factors of WCM by utilizing data of 20,189 firms listed in Taiwan stock exchange over the period from 1996 to 2004. Working capital requirements and net liquid balance were used for measuring WCM. The study concluded that operating cash flow and leverage has significant influence on WCM. Appuhami (2008) investigated factors, which determined the level of WCM by utilizing data of non financial 416 firms which are listed in Thailand Stock Exchange. WCM was taken as dependent variable and capital expenditure and operating expenditure were considered as independent variables. The author based on empirical findings suggested that there were many factors determining WCM like cash flow, growth and capital expenditure. Moreover, it was recommended that firms working in other countries might follow the pattern of capital expenditure in WCM. Valipour et al (2012) to investigate the effect of different firm characteristics on WCM performed. He employed panel data from 83 non-financial listed firms in Tehran stock exchange for the period of 2001 to 2010. The study was divided into two stages. In first stage, the influence of different firm characteristics on working capital management was assessed. The results indicated that performance, size, growth, cash flow and leverage significantly affect the length of CCC. In the second stage, the firms were divided into three categories in the light of their sizes such as large, medium and small. This analysis demonstrated that determining factors were performance, cash flow, leverage and growth in case of large size firms; average size firms were affected by performance, size, growth and leverage while the determining factors in small size firms were performance, current and quick ratio, growth and leverage. Gill (2011) analyzed 166 Canadian firms listed in Toronto Stock Exchange (TSE) for investigating the factors influencing working capital requirements in Canada. The study indicated that the practices and management of working capital differ from industry to industry as well as country to country. Palombini and Nakamura (2011) suggested that short-term assets and liabilities play very important role in balance sheets of firms. They explored key internal factors responsible for management of working capital in the context of 2976 Brazilian listed firms. Vaidya (2011) conducted a similar study on Indian firms by utilizing data from 1993 to 2006. After empirical investigation, it was concluded that firms that are more profitable maintains less trade credit. Additionally, access to bank credit and accounts payables were negatively while bank loans and accounts receivables were positively related to each other. It was also found that liquidity has positive influence on trade credit. The study conducted by Akinlo (2012) suggested that growth, size, operating cycle, permanent working capital and business indicator were significantly identified with working capital requirements in Nigeria. Also, influence has huge negative effect on working capital requirements. Naser et al (2013) analyzed determining factors for managing working capital in the context of non-financial firms listed in Abu Dhabi stock exchange. Azinfar and Kalili (2013) concluded that leverage, quick ratio and age were significantly related to working

capital. Zariyawati (2016) studied the small as well as large firms listed at Bursa Malaysia stock exchange and demonstrated that different firm characteristics like profitability, leverage, operating cash flow, capital expenditure has significant impact on WCM.

There were few international studies presented on determinants of WCM. Now there is description of studies given on determining factors of WCM in Pakistan. Nazir and Afza (2009) conducted a study by taking data of 132 manufacturing firms from 14 sectors which are listed in KSE and data period was moved from 2004 to 2007. The authors found that the internal factors, which have significant impact on determining working capital requirements, were return on assets, Tobin's q, leverage and operating cycle. It was also concluded that different industries have different requirements for WCM. In a study on 157 KSE listed firms for the year 2009 by Bhutto et al (2011) showed that forceful contributing arrangements and traditionalist financing policies are positively related to each other. Moreover, CCC has negative influence on sales, return on equity and financing policies while it has positive effect on assets return, total assets and investing policies of company. Iftikhar (2013) examined this relationship by utilizing data of 9 firm over the period of 2006 to 2010. CCC, ACP, APP and ITID were used as dependent variables whereas performance, firm size, and sales growth, debt to equity ratio, age, liquidity and market share were selected as explanatory variables. This study found that firm specific factors like profitability, sales and investing in current assets has significant impact on WCM components.

RESEARCH METHODOLOGY

Current research used data from manufacturing firms listed at Pakistan Stock Exchange (PSE). Data period for the study moves over the period of 2008 to 2013. Data that is more recent is utilized for presenting current picture of companies. The study sample includes four largest industries from manufacturing sector of Pakistan; textile, sugar, chemical and cement industry. These industries are selected according to their maximum contribution in the economy of Pakistan. The sample comprises of 59 textile firms, 23 sugar firms, 26 chemical firms and 19 cement firms based on convenient sampling. The selected textile firms have market share of 52% while sugar, chemical and cement firms have market share of 85%, 66% and 86% respectively, in terms of their sales. Financial data has taken from firm's annual reports.

The study examines determinants of WCM components of Pakistani firms. CCC, APP, ACP and ITID are included as dependent variables, as a measure of WCM components. The independent variables considered in this study are size, leverage, operating cash flow, liquidity, age, growth, GDP and financial crisis. CCC indicate the cash management of a firm and is defined as the time difference in which companies made payment against raw material purchases until it received cash against sales (Garcia & Solano 2010). It is suggested that there exists negative

relationship between length of CCC and performance (Lazaridis & Tryfonidis, 2006; Smith, 1980; Zariyawati et al, 2009, Mathuva, 2010). The companies with shorter CCC need less external financing to invest in operating activities, which is preferable to increase performance and indicate efficient use of working capital (Moss & Stine, 1993).

On the other hand, it is suggested by some authors that longer CCC may increase the performance of firms through increasing sales (Padachi, 2006; Deloof, 2003; Sen & Oruc, 2009; Raheman et al, 2010). Longer CCC means that the firm has larger collection period, which may entice customer for more purchases. In the same manner, higher inventory level suggests that firm have enough stock to meet urgent demands of customers, which ultimately increases sales. The benefit of cash discount could be enjoyed by early payments to the suppliers. However, extra investment in working capital increases the cost of interest payment for the firm. By concluding above discussion, negative relationship between CCC and performance is expected for efficient management of working capital. CCC is measured by adding inventory turnover in days to average collection period and deducting average payment period from this value (Uyar, 2009; Padachi, 2006; Zariyawati et al, 2009).

Large and small size firms have different impacts on lengths of cash cycle, payment period, collection period and number of days inventory. Larger companies have benefit of higher bargaining power and can get profit from economies of scale. For instance, there could be more negotiation power between firm and suppliers for discounts and longer payment terms (Rimo, 2010). Some researchers found positive relationship between firm size and CCC (Kieschnick, 2006; Niskanen&Niskanen, 2006; Petersen &Rajan, 1997). They argue that firms with increasing sales have more accounts receivables, which increase their collection period, and ultimate result is longer conversion cycle. The counter argument is that larger firms have a benefit of bargaining power, which indicates better management of working capital by decreasing cash conversion cycle (Nakamura &Palombini, 2009). It is suggested that larger companies have the benefit of economies of scale so they maintain lower inventory levels. While smaller firms have not such benefit that is why they get benefit from quantity discounts and volatile sales by maintaining high inventory levels. Concluding the discussion, this study expects negative relationship of CCC, ACP and ITID with size while positive influence of size is expected on APP (Moss & Stine, 1993; Jose et al, 1996; Nakamura &Palombini, 2009; Petersen & Rajan, 1997). In literature, size of firm is measured through natural logarithm of total assets (Garcia & Solano, 2010; Jeng-Ren, et al., 2006) or natural logarithm of total sales (Deloof, 2003; Jose et al., 1996). This study measured size of firm through natural logarithm of sales, as this is most commonly used measures by many authors.

Leverage is another variable which could affect the management of working capital and it is measured in the form of debt ratio. High value of debt ratio suggests that firm has not ability to finance its operations through internal funding, they have to rely on external financing and also more cash flow is needed to repay its debt (Nwaeze et al, 2006). Pecking order theory suggests that companies prefer using internal financing to external financing for running

the business activities (Myers, 1984). This indicates that firms firstly try to manage working capital in a way that less investment is needed in accounts receivable and inventories which is fulfilled from internal funds. Moreover, better terms and conditions with suppliers helps to maintain longer payment period. With that, if a firm has high debt ratio, its internal investment is low and rely on external financing for running its operations (Valipour et al, 2012). The firms with high leverage, give more importance to management of working capital to satisfy their investors and ultimate result is shorter CCC (Howorth&Westhead, 2003; Jeng-Ren, 2006). Leverage is measured by dividing total debt with total equity (Iftikhar, 2013) and also by dividing total liabilities with total assets, latter is used in this study because it is most widely used measure in many studies (Zariyawati et al, 2010; Valipour et al, 2012).

Operating cash flow is most appropriate variable representing the capacity of firm to generate internal resources for operating activities. When cost for external financing is high, it helps to made financial investment from internal resources. The operating decisions and credit policy of company is reflected by operating cash flow (Nwaeze et al, 2006). Pecking order theory suggests that firm focuses on internal financing over external as it is inexpensive source than external financing. The firms with larger capacity to generate internal resources have higher current assets level, which might be due to lower cost of funds invested in working capital (Garcia &Solano, 2010). In addition, these firms extend trade credit period to get competitive advantage, which increases their CCC. This suggests positive relationship between operating cash flow and CCC (Jeng-Ren et al, 2006; Hill et al, 2010). Operating cash flow is measured by adding depreciation to net profit and dividing it with total assets and also by dividing cash flow from operations to total assets, latter is most appropriate measure and applied by many authors and also used in this study (Valipour et al, 2012).

Liquidity measures the current position of firm. It indicates that in a current situation, a firm has enough current assets for investment in operating activities, which cannot increase their CCC. High liquidity ratio expresses solvency of the firm, which should lead to lower CCC and ultimately efficient management of working capital. The negative relationship between CCC and liquidity supposes inefficient management of working capital; they have made excessive investment in current assets (Iftikhar, 2013). In this study, liquidity is measured by dividing current assets to total assets (Iftikhar, 2013).

Sales growth is another important variable, which has effect on WCM. Some researchers argue that firms with higher sales growth need extra investment in receivables and inventories, which increase their receivables and inventory conversion period and ultimate result is longer CCC. They mostly face the problems of liquidity and bankruptcy due to inability of payment their bills and should have more focus on WCM (Chiou, Cheng & Wu, 2006; Nunn, 1981; Kim, et al, 1998). Sales growth is calculated by deducting previous year sales from current year sales and dividing the figure by previous year sales (Manoori& Muhammad, 2012; Zariyawati et al, 2010; Deloof, 2003).

Performance of a company is not only a result of efficient WCM but also a significant determinant of WCM. Liquidity and performance are two most important decisions taken by management. Liquidity measures the ability of firm to fulfill its current obligations. No firm can exist without maintaining sufficient amount of liquidity. Performance is the measure of return, attained by company on investment. If there is high investment in current assets, it may reduce this rate of return. Therefore, there is tradeoff between performance and liquidity (Deloof, 2003). Performance is calculated through different measures used in previous researches. Return on assets, return on equity, operating profit (Iftikhar, 2013) and Tobin' q (Nazir & Afza, 2009) are most frequent measures for calculating performance. In current study, performance is attained by dividing net income before tax with total assets as used by earlier researchers (Abbadi & Abbadi, 2013).

Age is another important variable used as a significant determinant of WCM. According to Chiou, Cheng and Wu, (2006): "*the older the firm, the worse its management of working capital*". The firms efficiently control their working capital in their starting years to manage higher growth rates. With the passage of time, this activity will slow down gradually which lead the firms towards inefficient management of working capital. Moreover, older firms have easy access to external financing (Berger & Udell, 1998) and cost of financing is also lower in these firms. (Iftikhar 2013). Age is calculated by deducting date of incorporation of company from financial data year (2013, 2012, 2010 or 2009).

The macroeconomic factor, which might be a significant determinant of WCM, is annual GDP. It is evident from empirical evidence that the country's economic conditions would affect the investment in trade credit and inventories. During economic slowdown, sales decreases and there may increase in accounts receivables and inventory periods. Negative relationship is expected between GDP and WCM. Smith, (1987), Lamberson, (1995), Chiou and Cheng, (2006), Walker, (1991) studied the relationship among GDP and WCM.

Simon et al., (2017) evaluated the effect of financial crisis on profitability and WCM. The financial crisis which starts from 2008-2009, affects the economic conditions of country, which might have influence on firm's investments in trade credit and inventories. GDP growth rate of Pakistan decreases to 0.4% in financial year 2008-09 against growth rate 5% in financial year 2007-08. There was increase in inflation level of 25% in October 2008 as well significant increase in oil and commodity prices was also observed. In addition, depreciation in the value of rupee is the result of decreasing domestic demand while international demand is affected by decrease in international demand due to global economic slowdown, which results in lowest growth rates in manufacturing sector of Pakistan. It is expected that financial crisis negatively influence the WCM. This study incorporated financial crisis in regression model as a dummy variable. On the basis of above discussion, following hypothesis have been formulated.

Objectives and Research Questions

Present study tries to analyze the factors which determine the components of WCM in Pakistan over the period of 2008 to 2013. To accomplish this objective, the study has some research Questions which are as follow,

1. What are the determinants of WCM components in manufacturing industry of Pakistan?
2. What is the association of GDP with each of WCM component?
3. What is the effect of financial crisis on WCM components?
4. What are the determinants of WCM components in textile, sugar, chemical and cement industry?

The findings of this study increase the awareness about WCM and provide new evidence on determinants of WCM components. It contributes in the existing literature in many ways; the association of different firm specific and macroeconomic factors with each component of WCM has been empirically examined. Moreover, this study also tries to investigate the effect of financial crisis and GDP on WCM components. Furthermore, this research has also comparatively examined the components of WCM in different manufacturing industries as there exists significant differences in their operations. This study has significance importance for managers, shareholders and regulators. The empirical findings provide new evidence on determinants of WCM components in organizational settings, specifically Pakistani firms. Moreover, this study helps managers to formulate strategies regarding WCM during period of financial crisis. Furthermore, the research study provides guidelines to the managers about trade credit polices of a firm which is helpful in timely provision of raw material and ultimately better relations with suppliers and customers. The regulators can use the study findings for formulating policies during the periods of economic growth as well as economic decline. In addition, they can define credit policies which could benefit both suppliers and a firm. Table 1 gives the summary of dependent and independent variables, their symbols and measurement of each variable.

Table 1: Variables of the study

Symbol	Definition	Measurement
Dependent Variables CCC	Cash conversion cycle	$ITID + ACP - APP$

ACP	Average collection period	$(AAR/CS)*365$
APP	Average payment period	$(AAP/CGS)*365$
ITID	Inventory turnover in days	$ITID = (AI/CGS)*365$
Independent Variables		
SZ	Size of firm	Natural logarithm of sales
LEV	Leverage	Total liabilities/total assets
OPCF	Operating cash flow	Operating cash flow/total assets
LQDTY	Liquidity	Current assets/total assets
GRWTH	Growth	$(\text{Current year sales}-\text{Previous year sales})*$ Previous year sales
PERF	Performance	Net income before tax/total assets
AGE	Age	No. of years from commencement of business
GDP	Gross domestic product	Annual GDP of country For textile industry, 1 for 2009 and 0 for other years For sugar industry, 1 for 2008 and 0 for other years
Dfc	Financial crisis	For chemical industry, 1 for 2008 and 0 for other years For cement industry, 1 for 2009 and 0 for other years

$$\begin{aligned}
CCC_{i,t} = & \beta_0 + \beta_1 SZ_{i,t} + \beta_2 LEV_{i,t} + \beta_3 OPCF_{i,t} + \beta_4 LQDTY_{i,t} + \beta_5 GRWTH_{i,t} \\
& + \beta_6 PERF_{i,t} + \beta_7 AGE_{i,t} + \beta_8 GDP_{i,t} + \beta_9 Dfc_{i,t} \\
& + \varepsilon_{i,t} \quad (3.1)
\end{aligned}$$

$$\begin{aligned}
APP_{i,t} = & \beta_0 + \beta_1 SZ_{i,t} + \beta_2 LEV_{i,t} + \beta_3 OPCF_{i,t} + \beta_4 LQDTY_{i,t} + \beta_5 GRWTH_{i,t} \\
& + \beta_6 PERF_{i,t} + \beta_7 AGE_{i,t} + \beta_8 GDP_{i,t} + \beta_9 Dfc_{i,t} \\
& + \varepsilon_{i,t} \quad (3.2)
\end{aligned}$$

$$\begin{aligned}
ACP_{i,t} = & \beta_0 + \beta_1 SZ_{i,t} + \beta_2 LEV_{i,t} + \beta_3 OPCF_{i,t} + \beta_4 LQDTY_{i,t} + \beta_5 GRWTH_{i,t} \\
& + \beta_6 PERF_{i,t} + \beta_7 AGE_{i,t} + \beta_8 GDP_{i,t} + \beta_9 Dfc_{i,t} \\
& + \varepsilon_{i,t} \quad (3.3)
\end{aligned}$$

$$\begin{aligned}
ITID_{i,t} = & \beta_0 + \beta_1 SZ_{i,t} + \beta_2 LEV_{i,t} + \beta_3 OPCF_{i,t} + \beta_4 LQDTY_{i,t} + \beta_5 GRWTH_{i,t} \\
& + \beta_6 PERF_{i,t} + \beta_7 AGE_{i,t} + \beta_8 GDP_{i,t} + \beta_9 Dfc_{i,t} \\
& + \varepsilon_{i,t} \quad (3.4)
\end{aligned}$$

For examining the determinants of WCM for Pakistani firms, Panel data methodology has been used. Panel data is defined as cross sectional data, which is described over time (Gujrati, 2003). There are many advantages of panel data analysis observed by researchers. First, by using suitable panel data modeling and estimation, unobservable effects of firm specific and time-invariant excluded variables would be controlled by researchers. Second, as cross section and time series both dimensions are included in panel data, so econometric measures would be estimated with improved efficiency. With that, it facilitate the researchers by having maximum number of data points which decrease the issues of multi-colinearity between independent variables as well as degree of freedom would be increased. Therefore, they can run the test with minimum number of observations. Third, consideration of cross sections and period individual differences would be possible in panel data by including dummy variables in model (Hsiao, 1985).

Initially, researchers have applied Ordinary Least Square (OLS) for estimating the determinants of WCM components but it may be biased. This biasness is due to the fact that factors specific to time and firm are not controlled in this method. Then Hausman test has been applied to choose between fixed and random effect models.

EMPIRICAL RESULTS AND DISCUSSION

Descriptive statistics are presented in Table 2. On average, a firm takes 39 days to complete its CCC. The CCC starts when a firm pays to its creditors for purchase of raw material. It ends when it receives money against sale of products. High standard deviation value (100.41) shows that firms are very sensitive towards minor changes as well as high value of range (1701.39) indicates that there are large differences between minimum and maximum values of CCC which represents much sectorial variation. Liquidity, which is used as independent variable given by current assets to total assets, is calculated in percentage units. The mean value for liquidity is less than 1 (.41) which means that current assets are 41% of total assets. Minimum and maximum values lie between 0.02 and 1.15 while standard

deviation is .18. Size of company is measured through natural logarithm of total assets. Mean value for size is 21.88. The value for leverage ratio is less than 1 which means that these firms have more assets than liabilities. If leverage value is greater than 1, this is not sometimes desirable situation for a company because it means firms finance their operations from liabilities. Standard deviation values for maximum independent variables except OPCF and LEV are very high. This shows that these firms are very sensitive towards minute changes in independent variables discussed in this study. The positive mean value for growth (.19) demonstrates that firms included in sample progresses positively in terms of sales but large standard deviation value (0.60) indicates that this growth rate is not consistent. The minimum value for PERF is -71.32 and maximum value is 246.64 while mean value is 0.97. But standard deviation for PERF is very high (12.68).

Table 2: Descriptive statistics

Variables	CCC	ACP	APP	ITID	LQDTY	SZ	LEV	GRWTH	OPCF	AGE	PERF	GDP	Dfc
Mean	39.13	29.1	62.75	72.8	0.416	21.9	0.7	0.194	0.07	32.96	0.97	0	0.17
SD	100.5	45.2	73.23	65.5	0.18	1.11	0.6	0.607	0.12	13.09	12.7	0	0.36
N	679	679	679	679	679	679	679	679	679	679	679	679	679

The results of regression are reported in Table 4. The Hausman results suggested that adjusted R^2 is given as 0.874. The value of R^2 determine how much the model is fit. It shows the amount of variation in dependent variable explained by all explanatory variables in the model (Pallant, 2013). For given sample, adj. R^2 value is considered because it gives more appropriate estimation in case of small sample size.

The study determined positive relationship between LQDTY and CCC. These results suggest that the firms who have huge investment in current assets as compared to current liabilities for financing their operating activities so they have the ability to cope with large CCC. Coefficient value indicates that if there is 1 percent change in current assets to total assets ratio, it will bring 57.39 times change in CCC. These results are inverse of the study conducted by Iftikhar, 2013. There is significant negative relationship found between LEV and CCC. These results are consistent with pecking order theory and also supported by previous studies (Palombini, 2011; Nazir&Afza, 2008; Jeng-Ren 2006). Pecking order theory explains that firms should finance their operating activities from internal funds and if internal financing is not sufficient than rely on debt financing as compared to equity financing. So empirical findings suggests that the firms with high leverage value (total liabilities/total assets) tend to select more efficient WCM to avoid issuance of new shares (equity). The research results express the negative relation between sales growth and CCC which suggests that increase in level of GRWTH negatively affect the length of CCC. These findings are consistent with previous studies of Kim, et al. (1998), Valipur, (2012), Palombini, (2011), Rimo and Panbunyuen (2010) and Iftikhar, (2013). In sum up, the firms which maintain high growth rate are more concerned about management of working capital. The reason may be that the growing firms need extra funds for financing its operation expansions which leads to low CCC. Well management of working capital provides internal financing sources which is cheaper than external financing in terms of administration expenses and interest expense (Pecking order theory). A significant negative relationship is found between operating cash flow and CCC which is according to the findings of Moss and Stein (1993), Manoori, (2012) and Chiou and Cheng (2006). Whether it opposed the results of Nasar, (2010) who found positive relationship between sales growth and CCC. OPCF is one of the liquidity measures which explains the cash generated from operating activities. The findings imply that the firms with maximum ability to generate cash, maintains shorter CCC and the result is effective management of working capital. AGE is found to be significantly and negatively related to CCC which specify that older firms are able to reduce their conversion cycle which implies that they are more interested in managing their working capital. Older firms get the knowledge about policies and practices which are helpful in shortening their CCC for efficient management of working capital. These findings are opposite to the evidences given by Boscher, (2011) and Jeng-Ren, et al. (2006). They argue that in earlier years of firms, they followed with high growth rates, which forced the firm management for efficient control of working capital, will slow down with the passage of time. But this study provide evidence inverse of this argument that older firms

are not interested in efficient WCM. SZ measured through natural logarithm of total assets, found negatively related to CCC but these results are not significant. Performance is one of important determinant of WCM supported by many studies (Manoori, 2012; Nazir, 2009; Deloof, 2003; Lazaridis&Tryfonidis, (2006), Jose, et al., 1996; Valipur, 2012; Nasar, 2010; Eljelly, 2004). Contrary to these prior studies, this study gives no evidence on significant relationship between PERF and CCC.

After analysis of internal factors which are affecting length of CCC, the study discusses macroeconomic impacts of country on WCM components. Annual GDP is used as independent variable and Dfc is included as dummy variable for finding the impact of financial crisis on WCM for the years 2008-09. In earlier studies, researchers did not find any significant relation between WCM components and GDP (Nazir&Afza, 2009; Garcia-Teruel& Martinez-Solano, 2012; Lamberson, 1995; Manoori, 2012; Boscher, 2011). However, this study shows the significant positive impact of GDP on CCC which implies that when Pakistani economy is growing well, firms have longer CCC.

Dfc and CCC is found negatively and significantly related to each other which indicates that in the periods of global slowdown, the firms are more interested in shortening their conversion cycle. Global crisis may negatively affect the efficiency of WCM because receivables are not collected in time and firms made delayed payments against purchases. But this study gives contrary results that financial crisis positively affect the WCM of sample of Pakistani companies.

Regression analysis (Table 4.8) shows that four independent variables of this model are significantly related to APP while five variables determined no relationship with APP. APP determined the payment policy of firm for trade creditors and LQDTY is positively related to APP. The firms which maintain high current assets to total assets ratio, has made delayed payment against their purchases.

There exists strong negative relation between SZ and APP which suggest that larger firms earlier clear their debts. These results are supported by the studies of Palombini, (2011) and Iftikhar, (2013). According to Meltzer (1960), larger firms have better opportunities to access capital market than smaller firms. Continuing this argument, the negative relationship suggests that large firms could save more cash by preferring cheaper financial credit on more expensive trade credit. They made delayed payments to suppliers due to their large negotiation power explained by Refuse, (1996). Moreover, smaller firms preferred the use of trade credit over financial credit due to requirement of large fixed costs for the arrangement of financial credit. However, it must be noticed that smaller firms with less abilities of financial management may also be ignorant about high trade credit cost in forgone discounts (Howorth&Reber, 2003).

AGE is found to be significantly positively related to APP. It is suggested from empirical findings that older firms made late payments to their creditors. This might be due to the fact that older firms have better terms with creditors so they take time for the payment against purchases of raw material.

Dfc significantly affect the payment policy of Pakistani companies. During the years of financial crisis, firms delayed payments to the creditors which increase payment period. In global slowdown period, there is significant decrease in sales of firms which create profitability losses. That's why there is not enough money available for payment to the creditors. In this study, LEV, GRWTH, OPCF, PERF and GDP have no significant impact on APP for entire sample. Adj. R² value is .758 which indicate fitness of the given model and also supported by value of F-statistic ($p < 0.5$).

The study determines the effect of explanatory variables (LQDTY, SZ, LEV, GRWTH, OPCF, AGE, PERF, GDP, Dfc) on ACP and provide evidences and logical reasoning behind the results in this part. LQDTY and ACP are positively related to each other at highly significant level. This positive relationship implied that the firms which have higher ratio of liquidity maintain larger collection period; they take extra time to collect their receivables. The maximum trade credit period indicates that the firms have the ability to handle large collection period.

SZ is found to be strongly and negatively associated with ACP which expresses that larger firms collect receivables in given time period and they do not maintain receivable terms with their customers. These results are in line with the study of Palombini, (2011) and Rimo (2010) and also supported by Darwinian Theory about negotiation power. The theory states that there is more negotiation power in larger firms as compared to smaller firms (Refuse, 1996). This study support its results by concluding that larger firms usually have established reputation, people know about their product quality so there is no need for extension of trade credit. However, smaller firms have not yet established reputation, they have a need to extend trade credit for guarantee to their product quality.

It is found that there is significant negative influence from GRWTH on ACP which is consistent with the findings of Boscher, (2011) and Palombini, (2011). The inverse relationship between two variables suggest that the companies with high growth rate need to collect receivables in minimum possible time for financing growth. Binks and Ennew (1996) point out that as the growth rate increases, firms face more problems in accessing bank credit. The reason is that although these firms are growing well and gaining profits but for maintaining sales growth, they might face the problems of liquidity and thus insolvency and ultimately lower growth rates. In that situation, firms reserve funds tied up in accounts receivables which could be used for financing growth.

The relationship between GDP and ACP is found to be significantly positive. It is suggested that when economy is doing well, the firms are less interested in efficient management of their accounts receivables, thus larger conversion period and more investment in working capital. The other argument for these results is that when GDP rate is high, sales increases and thus more accounts receivables and then larger conversion period. There is no significant relationship found between LEV, OPCF, AGE, PERF and Dfc and ACP. According to Mujis (2004) rule of thumb, this model is strongly fit ($\text{Adj } R^2 = 0.868$). F-statistic value is significant which supports the fitness of model.

The relationship between ITID and independent variables such as LQDTY, SZ, LEV, GRWTH, OPCF, AGE, PERF, GDP and Dfc are explained through Table 4.8. LQDTY is the single determinant of WCM which significantly influence all the components of WCM. LQDTY positively affect ITID as like other components; CCC, APP and ACP. The results suggest that increase in liquidity level lead to increase in inventory conversion period. These firms have enough liquidity available to cope with higher inventory conversion period.

The results show that the SZ is negatively associated with ITID which is supported by the studies of Iftikhar, (2013) and Palombini, (2011) and opposed the results given by Boscher, (2011). The negative relationship is according to the expectations that larger firms take less time to convert its raw material into finished products and thus less investment in working capital (low inventory levels) is required. As compare to larger firms, smaller firms are required to maintain high inventory level to get benefit from quantity discounts and to handle the volatility of sales (Boscher, 2011).

LEV which is calculated in terms of debt ratio, indicate negative influence on ITID. It is suggested from the findings that if the firms have high debt ratio, they are more interested in efficient inventory management due to pressure from finance providers for interest payment but there is no evidence for this reasoning. These results are in line with Palombini, (2011) and contrary to the studies of Jeng-Ren, et al. (2006) and Boscher, (2011).

Another variable GRWTH which is measured in terms of sales growth, shows significant negative affect on ITID as given by Nakamura and Palombini (2009). Highly growing firms are more interested in early conversion of inventory due to high market demand for products. They have to maintain low inventory level due high sales which forced them to early convert raw material into finished products.

AGE is also significantly affecting the inventory conversion period. There exists strong positive relationship between firm age and ITID as according to Chiou and Cheng, (2006), Garcia and Solano (2010). These results are in accordance with the statement that; "*Older the firm, the worse its management of working capital*" and also supported by

the statement that “*that firms focusing on stock management routines were younger*”. There is no significant influence from OPCF and PERF on ITID and also macroeconomic conditions (GDP and Dfc) have no effect on inventory management. This regression model is strongly fit ($Adj R^2 = .710$) and F-statistic value is also significant for given model.

Table 4: Regression results of Manufacturing Sector

Over the period of 2008 to 2013

<i>Variables</i>	<i>CCC</i>	<i>APP</i>	<i>ACP</i>	<i>ITID</i>
<i>C</i>	225.0948***	728.8445***	212.8537***	982.6198***
<i>T</i>	2.6431	8.6	6.7158	11.2598
<i>LQDTY</i>	57.3879***	34.8037***	18.7459***	93.7939***
<i>T</i>	4.393	2.736	3.6254	6.5389
<i>SZ</i>	-6.0272	-42.6156***	-9.5252***	-49.7082***
<i>T</i>	-1.3141	-9.4942	-5.6465	-10.6427
<i>LEV</i>	-9.8827***	3.1624	-1.4161	-10.7435***
<i>t</i>	-3.5069	1.1516	-1.4426	-3.9392
<i>GRWTH</i>	-5.4886***	-2.7655	-2.4387***	-9.0186***
<i>T</i>	-2.7508	-1.3517	-3.5238	-4.3387
<i>OPCF</i>	-37.0842***	8.3347	-6.6948*	-6.7877
<i>T</i>	-4.0773	0.9486	-1.84	-0.6678
<i>AGE</i>	-2.5164***	6.5918***	0.0071	3.9295***
<i>T</i>	-2.7503	7.2656	0.0199	4.0017
<i>PERF</i>	0.054	-0.0019	0.0135	0.0606
<i>T</i>	0.5912	-0.0215	0.3625	0.5846
<i>GDP</i>	278.9381***	-91.5864	52.1564*	38.3198
<i>T</i>	4.0212	-1.358	1.8953	0.503
<i>Dfc</i>	-7.2726**	10.9727***	-2.2457	1.483
<i>T</i>	-2.0008	3.0884	-1.5335	0.3647
<i>Adj. R2</i>	0.8739	0.7582	0.8679	0.7105

<i>F-</i> <i>statistic</i>	33.9831***	15.9163***	32.6708***	12.8286***
<i>Durbin-</i> <i>Watson</i>	2.1971	2.1149	1.7316	2.0116
<i>Hausman</i>	252.13***	268.88***	110.78***	375.06***
<i>N</i>	629	629	642	642

*** Significant at 0.01 level, **Significant at 0.05 level, *Significant at 0.1 level

CCC = Cash conversion cycle (ACP+ITID-APP)

APP = Average payment period (AAP/CGS)*365

ACP = Average collection period (AAR/CS)*365

ITID = Inventory turnover in days (AI/CGS)*365

SZ: Size of firm (Natural logarithm of sales), LEV: Leverage (Total liabilities/Total assets)

OPCF: Operating Cash flow (Operating cash flow/Total assets), LQDTY: Liquidity (Current assets/Total assets)

GRWTH: Sales growth (Current year sales-Previous year sales)*Previous year sales)

PERF: Performance (Net income before tax/Total assets)

AGE: Age of firm (No.of years from commencement of business)

GDP: Gross domestic product (Annual GDP of country), Dfc: Financial crisis (2008-09)

CONCLUSION

Liquidity is one of important decisions taken by the manager of the firm. It is observed that cash flow problems are sometimes faced by more profitable firms. Efficient management of working capital is required for the business to run

its operations smoothly and save itself from insolvency. It is necessary for the managers to maintain optimal level of working capital because excessive investment in working capital may adversely affect the profitability due to the loss of investment opportunities; on the contrary, less investment in working capital may lead to liquidity issues as well as decrease in production and sales level. The objective of this study is to analyze the determining factors of WCM. Manufacturing sector results suggest that older firms with higher sales growth, leverage and cash flow maintains shorter cash conversion cycle which indicate that working capital of Pakistani manufacturing industry is efficiently managed by increasing sales, leverage, age and cash flow. Moreover, when the country's GDP rate is high, firms manage large investment in working capital while during economic crisis; they have more focus on managing working capital by shortening their cash conversion cycle.

On the basis of research findings, there are some policy implications for firm managers and regulators. Managers may change their policies about working capital management based on factors, such as liquidity, size, sales, cash flow, leverage and performance. Leverage is negatively related to cash conversion cycle which indicate that leveraged firms have shorter cash conversion cycle. It is suggested that managers should more focus on issuing bonds rather than shares for better working capital management. Moreover, growth has negative association with cash conversion which suggest that firms efficiently manage their working capital when they have growth opportunities. Furthermore, this study helps managers to formulate strategies regarding working capital management during period of financial crisis. Cash conversion cycle have negative relationship with financial crisis which expresses that managers are more interested in efficient management of working capital during the period financial crisis.

There are some future research directions regarding determinants of working capital management. Comparative analysis of SAARC countries will be done in the context of working capital management. Moreover, cross country effects and cultural dimensions can be taken into consideration which will be helpful in comparing working capital management policies in developing and developed economies.

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