

IMPACT OF WORKING CAPITAL MANAGEMENT ON PROFITABILITY OF CEMENT SECTOR IN PAKISTAN

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ABSTRACT: *The main objective of the study was to find whether financial ratios affect the performance of the companies in the special context of cement industry in Pakistan. This study empirically examines the relationship between working capital management and profitability by using data of 10 Pakistani cement companies listed on Karachi Stock Exchange. The study is based on secondary data collected from financial reports of the sample companies for a period of five years from 2009-2013. The data was analyzed using the techniques of correlation coefficient and multiple regression analysis. All the findings were tested at 0.01 and 0.05 level of significance. We found that the return on equity (ROE) is negatively correlated with the Cash Conversion Cycle (CCC), current ratio (CR), and inventory turnover in days (ITD). While ROE is positively correlated with the Gross Working Capital Turnover (GWCT), Quick Ratio (QR), Average Payment Period (APP), Size of firms (LNSALES), and Funds allocated by government in Public Sector Development Program (LNPSDP). The relationship of Current Ratio is insignificant with ROE, but the relationship is not conclusive.*

KEYWORDS: Working capital, ROE, GWCT, CCC, LNSALES, LNPSDP

INTRODUCTION

No one can overlook the necessity of funds in a business unit either a retail shop or a large manufacturing concern. Cash is the only common factor in all small and large business units. Thus money management is must that is generally known as financial management. Proper management of invested funds in a business results in effective financial management. Every business unit needs funds for two purposes (I) for establishment and (II) to run its day to day operations. Long term funds are required to facilitate production through purchase of fixed assets such as plant and machinery, land and building, furniture etc. and also for expansion of business, renovation or upgrading of plant and machinery and research and development. The part of firm's capital which is blocked on a permanent basis is called fixed capital. Funds are also needed for short term purposes e.g., for the purchase of raw materials, payment of wages

and for meeting everyday expenses. All the goods which are produced in a given time period may not be sold in that period. Therefore, some goods remain in stock, e.g. raw material; semi finished goods and finished goods. These funds are known as working capital. In simple words working capital management refers to all aspects of current assets and current liabilities. The management of a working capital is of great importance not less than the importance of management of fixed capital.

Problem Statement

Every organization irrespective of size and nature of business needs necessary amount of working capital. Working capital is the most important factor for maintaining liquidity, survival, solvency and profitability of business. The impact of working capital management on profitability is highly important because firms required a balance between risk and efficiency to achieve an optimal level of working capital. When there is a surplus working capital, it may lead to unnecessary purchasing and accumulation of inventories causing more chances of theft, waste and losses. On the other hand for inadequate working capital, the firm cannot pay day-to-day expenses of its operations and it creates inefficiencies, increases costs and reduces the profits of the business.

Working capital management efficiency directly affects the profitability and liquidity of firms. Therefore, efficient management of working capital is a fundamental part of the overall corporate strategy to create shareholder value. In general, companies try to keep an optimal level of working capital that maximizes their value. Some firms try to increase their profits at the cost of liquidity which can bring serious problems to the firm. Therefore, there must be a swap between these two objectives of the firms. If we do not care about profit, we cannot survive for a longer period. On the other hand, if we do not care about liquidity, we may face the problem of insolvency or bankruptcy. For these reasons working capital management should be given proper consideration and will ultimately affect the profitability of the firm.

Objectives of the Study

The objective of this study was to investigate the relationship between working capital management, as measured through the cash conversion cycle, and corporate profitability in the developing country of Pakistan. This study enriches the finance literature on the relationship between working capital management and profitability.

In this study an effort has been made to analyze the empirical study of cement industry of Pakistan for investigating the effect of working capital on profitability during the period of 2008-09 to 2012-13. The more specific objectives are:

1. To study the various factors affecting working capital requirements in cement industry.
2. To analyze and evaluate working capital management with respect to trade off between liquidity and profitability.
3. To analyze relative asset liquidity and relative finance liquidity in cement industry.
4. To analyze the effect of working capital on the profitability of the cement companies listed on KSE of Pakistan.
5. To examine the collective impact of the ratio rating with working capital management and profitability.
6. To suggest, on the basis of conclusion, innovations in the management of working capital in cement companies in Pakistan.

Research Question

Is there any relationship between Working Capital Management (WCM) and profitability of firms in Cement Sector of Pakistan?

Importance of the Study

The purpose of the present study is to analyze the various concepts of working capital and find out the feasibility of the concept of working capital in the light of better planning and control of working capital. Problems of working capital management involve the problem of determining the optimum level of investment in each component of current assets i.e. inventory, receivables, cash, and other short term investment.

The basic focus in working capital management should be to optimize the firm's investment in working capital. An expert in the financial management is of the opinion that problem of working capital is one of the factors responsible for the low profitability in manufacturing sector. Better planning and control of working capital, or in other words, proper utilization of optimum quantity of working capital increases the earning power subject to the existence of operating margin.

Research Gap

We have selected first time as an independent variable funds allocated by government in Public Sector Development Program (PSDP) and its impact on profitability of cement companies in Pakistan. No such a study has been conducted on this sector.

Distinction of this study

World environment has rapidly changed since the Global Financial Crises (GFC). As such, Pakistani firms have unavoidably changed their working capital management practices. Consequently, this study reflects on working capital management practices post-GFC. Therefore, the results of this study may not coincide with the results of pre-GFC studies.

LITERATURE REVIEW

A large number of business failures have been endorsed to inability of financial managers to plan and control properly the current assets and current liabilities of their relevant firms (Smith, 1973). Due to be deficient in of a proper plan for working capital requirements most firms often experience excess working capital or shortage of working capital (Agarwal 1977).

Working capital management is important because of it causes firms' profitability, risk, and consequently its value (Smith, 1980). The greater the investment in current assets, the lower the risk, but also the lower the profitability obtained. Contrary to this, Carpenter and Johnson (1983) provided empirical evidence that there is no linear relationship between the level of current assets and revenue systematic risk of the US firms; however, some indications of a possible nonlinear relationship were found, which were not highly statistically important.

When any company retains its liquidity through borrowing, then there exists a swap between the profit earned from the investments in the assets that were financed from borrowing and the interest payable to creditors. Ultimately, it can be said that the too much little level and too high level of liquidity, both have costs associated with them (Yeager and Seitz, 1989).

Opposite to traditional belief, more investment in working capital (conservative policy) might also increase profitability. When high inventory is maintained, it lessens the cost of disruption in the production process, decrease in supply cost, protection against price fluctuation and loss of business due to stock out (Blinder and Maccini, 1991).

Czyzewski and Hicks (1992) also concluded that firms with the highest return on assets hold higher cash balances but they did not consider liquidity management beyond stagnant cash and assets ratio.

Soenen (1993) explored the relationship between the net trade cycle as a measure of working capital and return on investment in the US firms. The results of chi-square test showed a negative relationship between the length of net trade cycle and return on assets (ROA). Furthermore, this opposite relationship was found different across industries depending on the type of industry. A considerable relationship for about half of the industries studied indicated that results might vary from industry to industry.

The major reason for slow progress of an enterprise is deficiency or incorrect management of working capital (Siddarth and Das 1994).

Firms can lessen their financing costs and/or increase the funds available for expansion projects by minimizing the amount of investment blocked in current assets. Most of the financial managers' time and effort are allocated in bringing non-optimal levels of current assets and liabilities back toward optimal levels (Lamberson, 1995).

Some other researchers namely, Jose, Lancaster, and Stevens (1996) carried out a detailed analysis on the association of cash conversion cycle (CCC) and financial returns. They found an opposite relationship of profitability with cash conversion cycle.

(Bhattacharya, 1997) Though accounting ratios played a very important role in most of earlier empirical investigations, but a choice of ratios or group of ratios is often a difficult task due to the absence of a proper theory of ratio analysis.

To beat this problem Bhattacharya developed an alternative ratio model for the measurement and monitoring the efficiency of working Capital Management. He decomposed the total efficiency index of the working capital management into performance index and utilization index.

Shin and Soenen (1998) concluded that reducing the level of current assets to a reasonable extent increases firms' profitability.

Govind Rao and Rao (1999) studied the impact of working capital on profitability in Indian cement industry and found both positive as well as negative correlations between working capital related ratios and profitability.

Lyroudi and Lazardis (2000) investigated the cash conversion cycle and liquidity position of the food industry in Greece. They used cash conversion cycle (CCC) as a liquidity level indicator of the food industry in Greece and tried to verify its relationship with the traditional liquidity measurement and profitability measurement of return on investment (ROI), return on equity (ROE) and net profit margin. They found significant positive relationship between cash conversion cycle and current ratio, acid-test ratio, receivables collection period and inventory

turnover period and negative relationship between cash conversion cycle and payable deferral period. The relationship between liquidity measurement variable and profitability measurement variables were not statistically significant and there was no relationship between cash conversion cycle and leverage ratio.

Narasimhan and Murty (2001) stressed on the need for many industries to improve their return on capital employed (ROCE) by focusing on some important areas such as cost control, optimizing investment in working capital and improving working capital efficiency.

Wang (2002) analyzed a sample of Japanese and Taiwanese firms, stressed that the way the working capital is managed has a considerable impact on the profitability of firms and increase in profitability by reducing number of day's accounts receivable and decreasing inventories. A shorter Cash Conversion Cycle (CCC) and net trade cycle is related to better performance of the firms. Moreover, efficient working capital management is very vital to create value for the shareholders.

Deloof (2003) found a negative relationship between profitability and conversion of receivables and payables points to the fact that reduction of indices of conversion of receivables and payables can increase the profit of an enterprise.

Ghosh and Maji, (2004) in their paper made an attempt to observe the efficiency of working capital management of the Indian cement companies during 1992–93 to 2001–02. For measuring the efficiency of working capital management, performance, utilization and overall efficiency indices were computed instead of using some common working capital management ratios. Results of the study indicated that the Indian Cement Industry as a whole did not perform really well during this period.

Teruel and Solano (2005) suggested that managers can create value by dropping their firms' number of days' accounts receivable and inventories. Similarly, shortening the CCC also improves the firms' profitability.

According to Padachi (2006), high investment in inventories and receivables is associated with lower profitability. He used return on total assets as a measure of profitability for a sample of 58 small manufacturing firms in Mauritius for the period 1998–2003. His findings disclosed an increasing trend in the short-term component of working capital financing.

Afza and Nazir (2007) investigated the relation of working capital and profitability by taking a sample size of 263 listed public limited companies at Karachi Stock Exchange from 1998 to 2003 the result showed a negative impact of working capital policies on firms profitability.

Sing and Penny (2008) carried out a research about the effect working capital management on corporate profitability during the years 1990-2008. They found that current ratio, quick ratio and receivable turnover have sizable effect on working capital.

As stated by Siddiquee and Khan (2009), it has been observed that, firms which are better at managing working capital are found to be able to make counter cyclical moves to build competitive advantage. They are also better at generating fund internally and also face lesser trouble while seeking external sources of financing.

In their study Azhar & Noriza (2010) randomly selected 172 Malaysian firms to evaluate the effect of Working Capital Management on the firm's profitability and market value. Results show a strong negative association in working capital variables and firms performance.

Haq and Sohail and Zaman and Alam (2011) studied The Relationship between Working Capital Management and Profitability: A Case Study of Cement Industry in Pakistan. This study empirically examines the relationship between working capital management and profitability by using data of fourteen companies in cement industry in the Khyber Pakhtoonkhwa Province (KPK) of Pakistan. The study is based on secondary data collected from the financial statements of these companies which are listed in Karachi Stock Exchange for the period of six years from 2004-2009. The data was analyzed using the techniques of correlation coefficient and multiple regression analysis.

Ashraf (2012) examined the effect of working capital on the profitability of the 16 Indian firms. Results indicate that big firms are earning more profits. The study found strong negative relationship between working capital and profitability. Moreover, debt used by the firm, inventory turnover, average collection period, and average payment period & cash conversion cycle has a considerable negative relationship with profitability.

Working capital management of Iranian cements sector companies measured by Haji Hassani (2013). He finds that ROI is negatively correlated with current ratio & inventory turnover.

RESEARCH METHODOLOGY

Types of Data:

Secondary data has been used in this study.

Source of Data:

For the purpose of this study, secondary data have been collected from annual reports of the companies listed in the Karachi Stock Exchange. The reason for choosing this source is primarily due to the better reliability of the financial statements. Due to time constraint, only cement industry has been selected for the said research.

Sample Size:

Due to time constraint, only cement industry has been selected for the said research. The industry consists of 21 companies listed on KSE, 10 companies were taken as sample; this covers almost 50% of the population. The duration covered in this study was from year 2009 to year 2013 for this analysis.

Sample

In this study, we have used the companies accepted in Karachi Stock Exchange (KSE) across the period from 2009 to 2013. Because of the specific nature of their activities, firms in financial sector, banking and finance, insurance, leasing, modarabas, business services, renting and other services are excluded from the sample. This sample includes companies which have the following condition to signify:

1. Financial year of the companies ended on June 30.
2. Corporate financial reports should be published during the mention time.
3. During this time, they should not change their business or their financial year.

4. During the period the company should be listed on Karachi Stock Exchange.

The companies included into the sample are given below:

Cherat Cement	Fecto Cement
Fauji Cement	Bestway Cement
DG Cement	Poineer Cement
Kohat Cement	Maple Leaf Cement
Lucky Cement	Attock Cement

3.5 Selected Variables

Dependent Variable:

Return on Equity (ROE)

ROE indicates how well common stockholders' invested money is being used. The percentage is the result of dividing net earnings by common stockholders' equity. The ROE is used for measuring growth and profitability. You can compare a company's ROE to the ROE of its industry to determine how a company is doing compared to its competition.

$$\text{ROE} = \text{Net Profit after tax} \div \text{Stockholders' equity}$$

Independent Variables:

Current Ratio (CR)

Establishes the relationship between Current assets and Current liabilities. Normally, high current ratio is considered to be a sign of financial strength. It is the indicator of the firm's ability to promptly meet its short term liabilities (FTC, 2008). Shin and Soenen (1998) and Sharma and Kumar (2011) had used this variable in their research.

$$\text{Current Ratio} = \text{CR} = \text{Current Assets} / \text{Current Liabilities}$$

Quick Ratio (QR)

Establishes a relationship between quick or liquid assets and current Liabilities. An asset is liquid if it can be converted into cash immediately or reasonably soon without a loss of value. Cash is the most liquid asset. It is also known as acid test Ratio (FTC, 2008).

$$\text{Quick Ratio} = \text{QR} = (\text{Current Assets} - \text{Inventory}) / \text{Current Liabilities}$$

Cash Conversion Cycle (CCC)

The CCC start when the raw material purchase and not pay at the spot. The stay in giving the due is the outcome in delay in delay in the payable duration. The firm uses the raw material which will be converting into finished goods for sale.

Many authors like Shin and Soenen (1998) have argued that it is important for firms to shorten the CCC, as managers can create value for owners by reducing the cycle to a reasonable minimum level (Sharma and Kumar, 2011).

Cash Conversion Cycle = Receivable Turnover in Days + Inventory Turnover in Days – Payable Turn over in Days

$$\text{CCC} = \text{ACP} + \text{ITID} - \text{APP}$$

Inventory Turnover in Days (ITD)

Is the number of times inventory turned over in a year. It is relationship between Cost of Goods Sold and average inventory at cost (Shim & Siegel, 1998).

$$\text{ITD} = (\text{Inventory} / \text{Cost of Goods Sold}) \times 365$$

Gross Working Capital Turnover

Represents how effectively the working capital is utilized. Working capital turnover ratio is relationship between sales and working capital. Gross Working Capital Turnover is the number of times working capital turned over in a year. It is the relationship between Sales and Gross Working Capital.

$$GWCT = \text{Sales} / \text{Gross Working Capital}$$

Average Payment Period (APP)

The average period of length among material that purchased and labors the payment to them in the form of cash. The firm required to more time for payment of their dues, the delay in payment of the firm dues has positive impact on the firm's profitability.

$$APP = \text{Accounts Payable} / \text{Net Purchase} * 365$$

Size of Firm

This control variable is operational in two ways in the literature of WCM. The first type uses the natural logarithm of total assets to determine the size of a firm. This is used in the studies of Samiloglu and Demirgunes (2008) and Sharma and Kumar (2011). But the most widely used type of measurement is the natural logarithm of sales, which is used by Padachi et al. (2010), Dong and Su (2010), Deloof (2003), Raheman and Nasr (2007) and Karaduman et al. (2011). In this study the natural logarithm of sales will be used as a measurement for size, because it is often used in the working capital literature. The LnSales measures the size of the company and allows checking its relationship with profitability.

The size of the firm is measured as logarithm of Sales

$$\text{Size of Firm} = \text{Natural Log of Sales}$$

Funds allocated by government in Public Sector Development Program This is a new control variable. In every federal budget a huge amount is allocated by the government for development purposes. These may include construction of dams, canals, irrigation system, roads, bridges, new housing schemes. These development expenditures have direct connection with the profitability of cement sector. It is expected that funds allocated in PSDP has positive impact on profitability.

$$LNPSDP = \text{Natural Log of PSDP}$$

Hypotheses

As the objective of this study is to examine the relationship between working capital management and profitability, the study makes a set of testable hypotheses.

H1: There is a relationship between Current Ratio and Return on Equity.

H2: There is a relationship between Quick Ratio and Return on Equity.

H3: There is relationship between cash conversion cycle and ROE.

H4: There is a relationship between Average Age of Inventory and Return on Equity.

H5: There is a relationship between Gross Working Capital Turnover and Return on Equity.

H6: There is a relationship between Average Payment Period and Return on Equity.

H7: There is a relationship between firm size and Return on Equity.

H8: There is a relationship between funds allocated by government in Public Sector Development Program (PSDP) and ROE of cement companies.

Statistical Techniques:**Measurement and Analysis Plan**

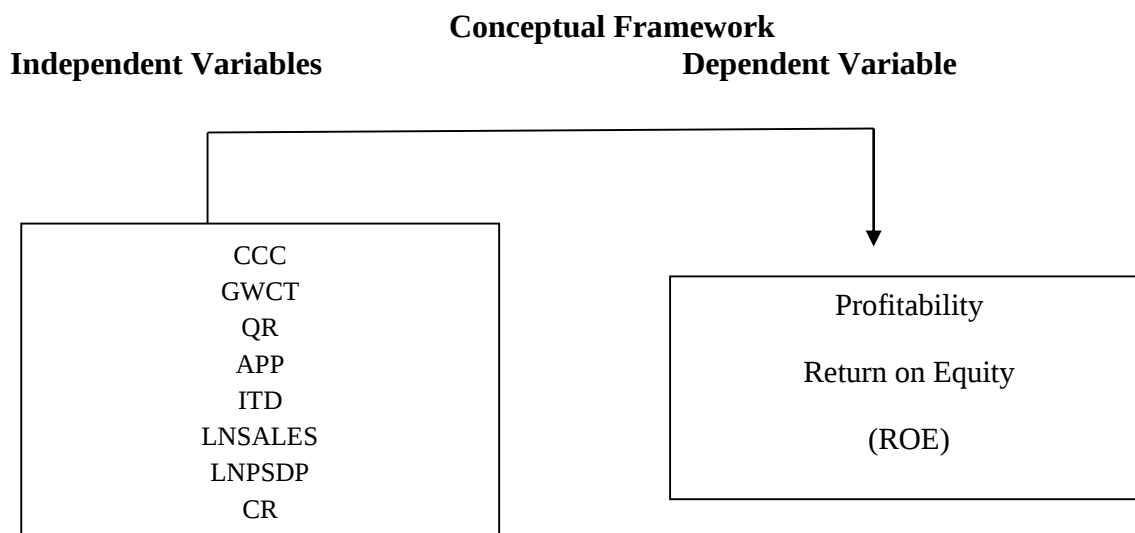
In this research we have provided two types of data analysis; descriptive and quantitative.

Descriptive Analysis

Descriptive analysis is the first step in this research. It helped to describe relevant aspects of phenomena of cash conversion cycle and provide detailed information about each relevant variable. E-Views software has been used for analysis of the different variables in this study.

Quantitative Analysis

In this analysis two methods were applied. Firstly correlation models to measure the degree of association between different variables under consideration. Secondly, to account for the effects of other construct, multiple regressions is applied for the hypotheses. These measures provided more information on the correlation structure between constructs and therefore facilitate a further step in hypotheses testing.

**Objectives of Working Capital:**

These are the objects, which can be fulfilled by ready cash i.e. working capital. The amount of working capital changes with change in circumstances in the same enterprise as well as it differs from firm to firm. For determining the amount of working capital in a business, one has to study the business under varying situations such as a newly started business an emerging business and a full-grown business. A new business requires more working capital to attain the initial expenses like promotion, production, advertisement etc. at the same time the amount of these beginning expenses depend on the size and type of business. The amount of needed working capital increases with increasing expansion and growth of business till it attains maturity. When a firm reaches at maturity the amount of working capital needed is called normal working capital. Besides above factors there are many other factors which control the need of working capital in a business.

Working Capital Management and Profitability in Cement Sector

The developing countries are generally faced with the problems of inefficient deployment of resources available to them. Capital is the scare productive resource in such economies and proper utilization of resource promotes the rate of growth, cuts down the cost of production, and above all boost up the efficiency of the production system.

The total capital of a company consists of fixed capital and working capital. The emphasis has ever been on the growth and efficiency of fixed capital. The management of working capital has often been neglected, resulting in under utilization of not only working capital but also fixed capital. Efficient management of working capital and efforts to reduce it or optimize its size must promptly enhance the profitability of an organization.

These efforts would simultaneously activate the flow of funds through the enterprise by focusing on dormant inventories and overdue receivables from credit customers. Thus working capital offers a common front for profitability and liquidity management. Importance of working capital can further be judged from the fact that many a time the main cause of the failure of a business enterprise has been found to be the shortage of current assets and their mismanagement. Fixed capital investment generates production capacity; working capital makes the utilization of that capacity possible. Skillful administration of current assets solves the problem of underutilization of capacities.

Cement industry, which is being investigated in the present study, is indeed the backbone of economic growth in any country. A deep relationship has been found between the level of economic growth and the quantum of cement consumption in developed as well developing countries. Cement industry, through its forward linkages provides the maximum stimulus to growth in other industries also. One employee in cement industry supports eight to ten persons in related activities. In Pakistan, since independence, great emphasis has been laid on the development of cement industry. It is one of the key central industries in Pakistan. It plays leading role in the national economy. Cement is very important input in building and construction works. The production and consumption of cement, to a large extent, designates a country's progress. The development of transport, infrastructure, irrigation and power projects etc. depends to a very large extent on the availability of the cement. The per capita cement consumption is regarded as one of the indicators of development and standard of living in a country.

Keeping in mind the above importance of the cement industry in the economic development, it is required to do an in-depth study of the problems faced by the industry especially in the area of working capital management. The study aims to analyze the working capital issues like liquidity and profitability aspects of the working capital management. In 1947, Pakistan had inherited 4 cement plants with a total capacity of 0.5 million tons. However, by the end of June 2011, the installed cement production capacity reached to the level of 49.58 million tones with 29 operating units of cement. For the period from 2003 to 2008 cement industry of Pakistan had registered an average growth rate of 20% due to economic boom in the country and high economic growth rate.

Industry Overview

The country recorded a modest GDP growth of 3.6% for the fiscal year ended 30 June 2013 which is a slight improvement over growth of 2.4% for the year before. While inflation and interest rates gradually declined during the year, deepening power crisis and poor law and order situation remained major obstacles in economic growth. General sentiment in the economy also remained uncertain due to national elections which took place in May 2013. Going forward, smooth transition of power to the newly elected democratic government should promise well for the country and provide some certainty and direction to the economy. However, any future increase in local demand would require higher infrastructure related government spending.

In the last Federal Budget, the Government kept a record Public Sector Development Budget together with an announcement of building 1000 housing colonies with 500 units each. Moreover, the Metro Bus projects in Lahore, Rawalpindi and Multan are launched by government and these projects may prove to be a trigger point for the revival of industry and may contribute positively towards the overall local consumption however it has to be seen as to how much fiscal space will be available with the Government to initiate and complete these ambitious projects and programs. The demand side of the equation may get affected because of imposition of GST on retail prices of the cement.

Over the years, Pakistan Cement Industry has largely been dependent upon exports to attain a decent level of capacity utilization and it seems that this trend would remain continue in foreseeable future also due to lack of investment in housing and construction sector by both the private and public sector investors.

To keep the momentum going the industry needs to control the higher energy cost by investing in capital incentive cost efficient projects. At present, the industry has marked its presence strongly in the markets of Afghanistan, Sri Lanka, Iraq, South Africa, East Africa and in some of the GCC countries and is deriving at least 25% of its consumption from these markets. This effort is by all means commendable as these exports are without any encouragement or support from the government in the form of subsidy.

RESULTS/FINDINGS

This chapter turned the analysis of the data that had been gathered for the research. We using the multiple linear regression model for the research and analyze the data to show which independent variable significantly affect the ROE of a firm. This study showed that the relationship between the independent and dependent variables are positive or negative.

Measurement and Analysis Plan

In this research we have provided two types of data analysis;

4.1 Descriptive analysis; and

4.2 Quantitative analysis

Descriptive Analysis

Descriptive analysis is the first step in this research. It helped to describe relevant aspects of phenomena of cash conversion cycle (CCC) and provide detailed information about each relevant variable. E-Views 5 software has been used for analysis of the different variables in this study. E-Views 5 for Windows is probably the most widely used computer software for analysis of quantitative panel data for social scientists.

Descriptive statistics shows the mean and standard deviation of the different variables used in the study. It also presents the minimum and maximum values of the variables, which help in getting a picture about the maximum and minimum values of a variable.

Table-1 provides descriptive statistics of the collected variables. All variables were calculated using balance sheet (book value) values. The book value was used because the companies did not provide any market value related to the variables that we used in this study. In addition, the measurement of profitability could only be based on income statement values, not on so-called market values. The explanatory variables are all firm specific quantities and there is no way to measure these variables in terms of their 'market value.' moreover, when market values are

considered in such studies, there is always a valid question of the date for which the 'market values' refer. Hence, 'book values' as of the date of the financial reports is considered.

Table – 1 Descriptive Statistics

	Mean	Median	Maximum	Minimum	St. Deviation
ROE	18.45%	12.41%	92.73%	-37.11%	27.14%
CCC (days)	3.82	5.21	58.10	-25.88	17.48
APP (days)	34.3	31	74.8	10	16.6
CR (Times)	1.22	0.92	3.38	0.27	0.78
QR (Times)	0.99	0.76	4.09	0.05	0.81
GWCT (Times)	2.79	2.86	4.90	0.69	0.98
ITD (Days)	32.20	27	98.33	13	18.55
LNPSDP	20.30	20.31	20.59	19.98	0.21
LNSALES	16.06	16.21	17.45	14.88	0.72

Table-1 gives descriptive statistics for ten cement Companies in Pakistan for a period of five years from 2009 to 2013 and for a total 50 firms-year observations. Looking at table-1, it is seen that the average value of return on equity (ROE) is 18.45% of common equity, and standard deviation is 27.14%. This figure means that the value of profitability can deviate from mean to both sides by 27%. The maximum and minimum values of return on equity (ROE) are 93% and -37% respectively.

Information from descriptive statistics also indicates that the mean of cash conversion cycle (CCC) that used as a comprehensive measurement of managing working capital is 3.82 days and standard deviation is 17.48 days. The maximum and minimum values of cash conversion cycle are 58.10 days and -25.88 days respectively.

The mean time of paying to suppliers is 34.3 days and the standard deviation is 16.6 days. Maximum time taken by the firm to pay for their suppliers is 74.8 days while minimum time taken for this purpose is 10 days.

Moreover, it takes an average 32.20 days in order to sell inventory with standard deviation of 18.55 days. Maximum time taken by a firm is 98 days, while minimum time to convert inventory into sales is 13 days.

From Table-1 it is seen that the mean of current ratio (CR) is 1.22 times and standard deviation is 0.78. The average value of current ratio (CR) is below the accepted value of 2:1 ratio. The maximum value of current ratio for a firm in a year is 3.38 times while the minimum value is 0.27 times. If current ratio of a firm is more than mean or accepted value, that may indicate the existence of surplus current assets that are burden for the firm.

Furthermore, it is seen that the mean of quick ratio (QR) is 0.99 times and standard deviation is 0.81 times. The maximum value of quick ratio for a firm in a year is 4.09 times while the minimum value is 0.05 times.

Information from descriptive statistics also indicates that the mean of Gross Working Capital Turnover (GWCT) is 2.79 and standard deviation is 0.98. The maximum and minimum values of GWCT are 4.90 and 0.69 respectively.

The mean value of LNPSDP is 20.30 and the standard deviation is 0.21. Maximum value is 20.59 while minimum value is 19.98.

The average value of LNSALES is 16.06 and the standard deviation is 0.72. Maximum value is 17.45 while minimum value is 14.88.

Quantitative Analysis

In this analysis two methods were applied.

Correlation analysis

Regression analysis

Firstly correlation models, specifically Pearson correlation to measure the degree of association between different variables under consideration.

Secondly, to account for the effects of other construct, multivariate linear regression is applied for testing of the hypotheses. These measures provided more information on the correlation structure between constructs and therefore facilitate a further step in hypotheses testing.

Correlation Analysis

The descriptive statistics show the working capital measures and its variations among the firms in sample industry. The correlation analysis is done to analyze the association between the working capital management components and profitability. To examine the relationship among these variables, Pearson correlation coefficients are calculated.

Table – 2 **Correlation Matrix**

	LNSALES	LNPSDP	ITD	GWCT	CCC	CR	APP	QR	ROE
LNSALES	1								
LNPSDP	0.268	1							
ITD	0.205	0.261	1						
GWCT	0.434	0.052	0.108	1					
CCC	0.146	0.291	0.578	0.040	1				
CR	0.246	0.403	-0.043	-0.084	0.403	1			
APP	-0.104	-0.060	0.436	0.003	-0.432	-0.479	1		
QR	0.005	0.138	-0.142	-0.354	0.275	0.738	-0.411	1	
ROE	0.177	0.371	-0.156	0.141	-0.354	-0.471	0.143	0.480	1

Correlation matrix of all variables included in the analysis is presented in above table which is calculated based on data of 10 firms with 50 firms' year observations. Pearson's correlation analysis is used for data in table-2 to find the relationship between working capital management and profitability.

We found that the return on equity (ROE) is positively correlated with the quick ratio (QR). This relationship between Quick Ratio and Return on Equity is contradictory to the conventional belief which shows a positive association between Quick Ratio and profitability. The strongest correlation was observed, in our analysis, between ROE and QR (Quick Ratio) ($r=0.48$).

ROE is very weak positively correlated with the average payment period (APP). It means when payment period increases profitability will also increase. This relation between APP and Return on Equity (ROE) suggests that less profitable firms should wait longer to pay their accounts payables and take full benefit allowed to them from their suppliers. Its correlation coefficient accordingly is 0.143. And the result is also significant.

The CR, in the analysis, has a significant negative relationship with ROE. The coefficient of correlation is -0.471. This shows that as the firm's current ratio increases, the return on equity (ROE) will decrease. It reveals the need for balance between CR and profitability because these two objectives have an inverse relationship. But the results are not significant.

The cash conversion cycle (CCC) that is used as a comprehensive measure of working capital management has a negative correlation with the Return on Equity (ROE) with coefficient -0.354. It also shows a significant at $\alpha = 5\%$. It implies that if a firm is able to reduce the CCC, it can enhance the profitability for the firm and will ultimately create value for the shareholders.

This demonstrates that paying suppliers timely and collecting payments from customers earlier, and keeping products in stock less time, are all associated with an increase in the firm's profitability. Based on the research data it can be concluded that companies have to deal with problems of management of receivables, payables and inventory seriously because they have an essential impact upon profitability. Similar result was found in the study conducted by Deloof (2003) for Belgian firms.

From our analysis of correlation results between the Gross Working Capital Turnover (GWCT) and the ROE indicate a positive relationship. The correlation coefficient is 0.141. It explains as gross working capital turnover increases the ROE of the firm will also increase. Less profitable firms can increase their profitability by increasing the working capital turnover. The result is also significant.

From table-2 the analysis of correlation results between the inventory turnover in days (ITD) and the ROE indicate a negative relationship. The correlation coefficient is -0.156. It explains when the firm takes less time to convert inventory into sales will positively affect its profitability of the firm. The result is also significant.

From our analysis of correlation results between the Natural Log of Public Sector Development Program (LNPSDP) and the ROE indicate a positive relationship. The correlation coefficient is 0.371. It elucidates as the government allocates more funds in public sector development program the ROE of the firms in cement sector will also increase. The result is also significant.

Analysis also shows a positive relationship between SIZE (Natural Log of Sales), used to measure the size of a firm and the ROE. Its correlation coefficient accordingly is 0.177. It implies that the size is associated with increase in the performance of firm. But the result is not significant.

The correlation coefficients for all measures of working capital management are significant except for Size of Firm (LNSALES) and Current Ratio (CR).

Data reflects high correlations between different measures of working capital management. The correlation between ROE and Cash Conversion Cycle (CCC) is (-0.354), ROE and ITD is

(-0.156), CCC and APP is (-0.432), CCC and ITD is (0.578). This has been taken into account in the regression analysis to avoid multi-collinearity problem.

Regression Analysis:

Simple linear regression analysis was done for return on equity (ROE) with Current Ratio (CR), Quick Ratio (QR), Gross Working Capital Turnover ratio (GWCT), Cash Conversion Cycle (CCC), Average Payment Period (APP), Inventory Turnover in Days (ITD), Size of firm (LNSALES), Public Sector Development Program (LNPSDP) Natural Log of PSDP.

Regression model is:

$$\text{ROE} = \beta_0 + \beta_1 \text{CR} + \beta_2 \text{QR} + \beta_3 \text{GWCT} + \beta_4 \text{APP} + \beta_5 \text{ITD} + \beta_6 \text{CCC} + \beta_7 \text{LNSALES} + \beta_8 \text{LNPSDP} + \epsilon$$

Regression Analysis shows predictors and their relationship. Predictor means variables used in study. Coefficient of predictors shows the impact of independent variables on dependent variable ROE.

Data analysis would be carried out as to fulfillment of the objectives and hypothesis both:

Dependent Variable: ROE

Method: Panel Least Squares

Sample: 2009-13

Total panel (balanced) observations: 50

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-8.927868	3.482642	-2.563533	0.0141
CCC	-0.015552	0.006414	-2.424773	0.0198
GWCT	0.09202	0.036824	2.498884	0.0166
QR	0.184164	0.062506	2.946346	0.0053
APP	0.01579	0.006428	2.456651	0.0183
ITD	-0.012663	0.006446	-1.964476	0.0563
LNSALES	0.043196	0.056188	0.76877	0.4464
LNPSDP	0.382804	0.170473	2.245533	0.0302
CR	-0.022769	0.065995	-0.345005	0.7016
R-squared	0.523521	F-statistic		5.63098
Adjusted R- squared	0.430549	Prob(F-statistic)		0.000078
S.E. of regression	0.204806	Sum squared resid		1.719768

Table – 3 Regression Analysis (Source E Views constructed by authors)

R-Squared is 0.523521 and adjusted R-squared is 0.430549 which makes clear that the independent variables included in the model have physically powerful impact on ROE. The value of F-Statistic is highly significant at 1 percent level of significance which shows that the model of our research study is good fit. F-Statistic value 5.630980.

DISCUSSION

The result points towards that CCC is significant at 5% level of significance. The relationship between CCC and ROE is negative as stated by the theory of WCM, and the coefficient of -0.016 that means one day increase CCC brings -0.016 decreases in ROE. It shows that firms' performance can be increased with short size of Cash Conversion Cycle (CCC). The Cash Conversion Cycle offers simple and practical way to check working capital management efficiency. For value creation of shareholders, firms must try to keep this to a minimum level. These findings are consistent with the results of Shin and Soenen (1998), Azam and Haider (2011). Therefore we accept H_1 .

The natural log of sales is used for size of the firms in the regression model as this log transformation reduces the heteroskedasticity and also the influences of outliers in the regression model. Size is positively associated to profitability but it is insignificant which means that larger firms are not more profitable in cement sector in Pakistan. These findings are consistent with the results of Amarjit, G., et. Al (2010) Therefore, we reject H_1 .

Quick ratio (QR) has a weak positive impact on performance (ROE) of the sample firms. This means when there is increase in quick assets the profitability (ROE) of the firms in cement sector will also increase. Moreover, the results are significant at 1% level of significance. These findings are consistent with the findings of Hassani (2013). Therefore, we accept H_1 .

Average Payment Period (APP) is found to be significant positive association with Return on Equity (ROE) indicating that if time period of supplier's payment is increased then firm's overall performance also improves. Coefficient of 0.01579 means one day increase in APP brings 1.58% increases in ROE. Ideally, the accounts payable period should be equal the standard credit settlement terms offered to the organization. This would ensure that an organization avails of the maximum credit available without damaging its credit rating/supplier relationships. These findings are consistent with the results of Raheman et al (2011), Azam and Haider (2011). So the H_1 is accepted.

It was found that inventory turnover in days (ITD) has negative relationship with indicator of firm performance i.e. Return on Equity (ROE) which means that companies performance can be increased by reducing inventory holding period in days. Coefficient of -0.012663 means one day decrease in inventory holding period brings 1.2663% increases in ROE. Moreover, the results are significant at 5% level of significance. These findings are very consistent with the results of Azam and Haider (2011). Therefore, we accept H_1 .

The Gross Working Capital Turnover Ratio (GWCT) also has a significant positive impact on profitability. By the increase in turnover of working capital the profitability will also increase. Coefficient of 0.09202 means one time increase in GWCT brings 9.202% increases in ROE. This shows the efficiency of working capital; more turnover more efficiency. The results are significant at 5% level of significance. These findings are consistent with the findings of Raheman et al (2011). Therefore, we accept H_1 .

The Current Ratio (CR) which is a theoretical measure of liquidity has no significant impact on profitability in case of Pakistan's cement manufacturing firms. This is consistent with the findings of Raheman et al (2010) and Azam & Haider (2011). Therefore we reject H_1 .

The natural log of public sector development program (LNPSDP) has a moderate positive impact on profitability. The result implies that one unit increase in allocation of funds in federal budget in PSDP the ROE will increase by 38.28% of the sample firms in cement sector of Pakistan. It is significant at 5% level of significance. Therefore, H_1 is accepted.

According to this study if the Cash Conversion Cycle (CCC) increases by one day then Return on Equity (ROE) of the sample firms will decrease with 1.6%, If there is 1 time increase in Gross Working Capital Turnover (GWCT) then Return on Equity (ROE) will also increase by 9.2%. We also found that if there is 1 time increase in Current Ratio (CR) then Return on Equity (ROE) will decrease with 2.3% but the result is not significant. The empirical evidence shows that if there is 1 time increase in Quick Ratio (QR) then Return on Equity (ROE) will increase by 18.4%, if there is 1 unit increase in size of firm (LNSALES) the Return on Equity (ROE) will increase by 4.4% it means there is positive relationship, if there is 1 unit increase in Public Sector Development Program (LNPSDP) then Return on Equity (ROE) will increase by 38.3%, if Average Payment Period (APP) of selected firms increases by one day then Return on Equity (ROE) will also increase with 1.6%, if Inventory Turnover in Days (ITD) that is the inventory holding period of selected firms decreases by one day then Return on Equity (ROE) will increase with 1.3%,

Finally, the column 'P' lists the P-values associated with the t-statistics given in the 'T' column. P values show the significance level of the variables which is for 0.7016 for Current Ratio (CR), 0.0053 for Quick Ratio (QR), 0.0563 for Inventory Turnover in Days (ITD), 0.0302 for Public Sector Development Program (LNPSDP), 0.0183 for Average Payment Period (APP), and 0.0166 for Gross Working Capital Turnover (GWCT), 0.0198 for Cash Conversion Cycle (CCC), showing that all these variables are significant, but 'P' Value of Size of firm (LNSALES) is 0.4464 and 0.7016 for Current Ratio (CR) which shows that these variables are insignificant.

The "F value" and "Prob (F)" test the overall significance of the regression model. R-Squared tells that change of 52% in dependent variable Return on Equity (ROE) is explained by independent variables of our model, while 48% is explained by other factors and error term.

IMPLICATION TO RESEARCH AND PRACTICE & LIMITATIONS OF THE STUDY

These results suggest that managers can create value for their owners by decreasing the number of accounts payable days and inventory holding period in days to a reasonable minimum level and decreasing the Cash Conversion Cycle (CCC). The negative relationship between accounts payable and profitability is consistent with the view that less profitable firms should wait longer to pay their bills and payables.

- The study is restrained to five years data only, i.e. from 2009–2013, therefore, a detailed analysis covering a lengthy period, which may give different results has not been made.
- The study is based on secondary data the study depends purely upon the accuracy, reliability and quality of the secondary data source. Approximation, and relative measures with respect to the data source might affect the results.
- The study is based on 10 cement producing companies of Pakistan that are listed at Karachi Stock Exchange (KSE). Therefore, the accuracy of results is purely based on the data of sample units. If one takes sample units from, say, successful firms the results may go slightly different.

- One of the major limitations in this study is missing observations. It was noted that the number of missing observations was significant which could affect the results. Following preliminary data analysis, the time period was narrowed to 2009-2013 to avoid econometric problems.
- In addition, the world environment has rapidly changed since the Global Financial Crises (GFC). As such, Pakistani firms have unavoidably changed their working capital management practices. Consequently, this study reflects on working capital management practices post-GFC. Therefore, the results of this study may not coincide with the results of pre-GFC studies.
- Industry differences also influence the association between working capital management and profitability.

CONCLUSIONS AND RECOMMENDATIONS

The study analyses the impact of Working Capital Management on performance of cement sector in Pakistan. The duration of the study is from 2009 to 2013. The data used in this study was taken from the published financial statements of cement companies listed at Karachi Stock Exchange. Return on Equity (ROE) was used as the dependent variable in order to test the impact of Working Capital Management on firm's profitability. Independent variables were, Inventory Turnover in Days (ITD), Cash Conversion Cycle (CCC), Quick Ratio, Current Ratio, Gross Working Capital, Average Payment Period (APP), Size of Firm, and Funds allocated by government in Public Sector Development Program. Panel Data method is used to study the impact of Working Capital Management on profitability of Cement sector of Pakistan.

Results shows that cash conversion cycle (CCC), Inventory turnover in Days (ITD) and Average Payment Period (APP) have negative relation with firm performance and their probability is significant. By using these variables the efficiency of working capital management can easily be verified. Current Ratio (CR) has proved statistically insignificant and has negative impact on ROE in this study. Same result was concluded by Deloof (2003), Shin and Soenen (1998), Rajan and Zingales (1995) and Myers and Majlof (1984). Firm Size (natural log of sales) has positive relationship with profitability but it is found to be insignificant.

This study finds a negative relationship between cash conversion cycle (CCC) and profitability of the Firm. This result is in accordance with the findings of Shin and Soenen (1998) and Lazaridis and Tryfonidis (2006) and many others. This study extends the earlier said studies in the sense that this study shows a relationship of profitability with the firms' cash holding position along with other indicators. And we also recommend that the firms in cement sector should forecast their sales and hold enough cash according to their projected sales level, so that they are able to take advantage of the bargaining position while making cash purchases and thus cut their cost. It is very clear that the efficient management of working capital and liquidity has a positive effect on the firm's profitability. So this study clearly affirms that, firms in the cement industry in Pakistan have sufficient scope to improve their profitability by managing their working capital in more efficient ways. Especially, the inventory if handled proficiently can produce a significant positive impact on profitability of the firm.

Consequently this study finds sufficient proofs that a firm is likely to enjoy better profitability if the firm manages its working capital with better efficiency and focuses on inventory and cash position with more care.

The major elements of working capital are inventory, accounts receivables, cash and bank balances and short term investments. Inventories are composed into raw materials; work in process, finished goods, stores and spares, and packing materials etc.

Cash management can be made more efficient through cash flow statements, cash budget and other steps.

FUTURE RESEARCH

Further studies could be made by future researchers in the following aspects and areas:

- By inclusion of superfluous variables like profitability ratios (gross profit ratio, net profit ratio, etc) and analyzing the inter-relationship between the Working capital management and profitability.
- Every sector in manufacturing sector should be studied at micro level for efficient working capital management so it can be understood that which factors of working capital management influence profitability more and how working capital management can increase productivity and profitability in different sectors of our country.
- The influence of interest rate risk, foreign exchange risk, business risk, political risk and competitor risk on working capital management could be analyzed in future research. A further possibility for research is the development of a risk-adjusted working capital rating. The conventional working capital ratio can be promoted to a risk-adjusted working capital ratio.

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