

Impact of Working Capital Management on the Profitability of firms: Case of Pakistan's Cement Sector

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ABSTRACT

The aim of this study is also to find out the component wise connection between the effective management of working capital and productivity in the context of Pakistan's cement sector. There are studies proving both, relevancy and irrelevancy of working capital management with profitability, but most of the studies advocate an inverse relationship between liquidity and profitability. Thus, a firm should maintain a delicate balance of working capital so that smooth operation can be achieved without disturbing the profitability. Panel data of 18 companies listed in KSE from cement sector from 2007 to 2011 is collected. Profitability of Companies, being dependent variable, is gauged through Return on assets (ROA). Efficiency of working capital management is calculated through six accounting ratios. Panel Least square method of regression is applied for analysis. Results suggest that assets turnover ratio (ATO), current ratio (CR) and size of the firm (SLS) have positive and significant affiliation with the return on assets (ROA). Inventory, account receivable and payable, the most important elements of working capital, found insignificant. Thus, it can be inferred that in cement sector of Pakistan, efficiency of working capital management has least role to play in enhancing the profitability of firms.

Keywords: *Efficient Working Capital Management, Components of Working Capital, Profitability*

INTRODUCTION

Efficient management or utilizing the organizational resources is an essential for the success of any organization. These resources can be bifurcated into long term assets and short term assets. Long term assets represent installed capacity of the firm whereas short term assets represent the nature and requirement of the daily operations of the firms. Therefore, short term assets are referred as working capital. Working capital is conceptually defined as "the investment used to meet the requirement of day to day operations". The role of short term liabilities is also very important in day to day working of firms. Therefore, the term net working capital is used for the difference between short term assets and short liabilities. This concept is also very important for gauging the efficiency of the firms.

For any organization, working capital is as important as the blood and nervous system for the life and no business can be run successfully without working capital management. Those firms, which manage their working capital properly and time to time, can maintain liquidity by continuous flow of production without facing any financial problem related to short-term liabilities like wages, payment of salaries, purchasing of raw material, overhead and so on. Working capital serves as lubricant in the operations of any business.

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It is also a fact that too many liquid assets reduce the profitability of the firms. It means that there is an inverse relationship between liquidity and profitability. For instance, If the firm invests in bulk in working capital i.e. excess than its requirement, then the revenue, which could be generated from investing those funds in fixed assets, will be shrunk. Besides this, firm will have to bear the cost of handling excessive amount of inventory as well as the cost of storage of inventory for longer periods. This situation demands that a firm should maintain a delicate balance of working capital so that smooth operation can be achieved without disturbing the profitability. This delicate balance has always been the area of investigation for researchers in the field of finance and accounting. Working capital gives us a good parameter to find out the delicate balance. The desired purpose of working capital management is to enhance profitability while maintaining adequate liquidity.

Background of study

Various researches have been conducted on working capital to find out the importance, nature and relationship of working capital management and its components with profitability of firms. For instance, Smith (1980) highlighted the importance of working capital management in case firm's profitability and risk value. According to Filbeck and Krueger (2005), the significance of management of WC is indisputable. Kargar and Blumenthal (1994) also discussed that the tradeoff between the profitability and liquidity is the major competent in management of WC. They concluded that proper management of working capital reduces the chances of bankruptcy. Some researchers like Smith et al. (1997) are of the opinion that profitability and liquidity is a salient roll of management of working capital.

Recent researches on working capital management are more inclined to investigate the relationship of working capital management with profitability. These researches divide working capital into its components like account receivable, inventory, cash and account payable etc. to know impact of each component on profitability of firm separately. Such researches further go to know the impact of working capital on various industrial sectors; because the dynamics of different sectors are different. Some industries have to maintain high levels inventories whereas others work with large credit sale and credit purchases. Author is using same approach on the cement sector of Pakistan.

Cement sector

Cement sector is highly important sector for any economy. It is argued that 20 other industries are interconnected with cement and construction sector. In Pakistan, cement sector is a vibrant, growing and employment generating sector. With the production capacity of 20 million tons out of that production, 11 million tons cement exported from Pakistan which contributes excellently in the growth of Pakistani economy. Pakistan is ranked 5th in the cement exports. Most of cement producing firms are listed in KSE.

Objectives of study

This study is aimed to find out the connection between the effective management of working capital and productivity in the context of Pakistan's cement sector. This query will be determined by studying the effect of different components of working capital management on the profitability of the cement sector companies.

LITERATURE REVIEW

Every business requires working capital for its day to day business operations. Working capital is an important parts of business strategy, which is fundamental for continuous operations of the business. The task of financial management cannot be completed without proper working capital management. A number of studies have been conducted on the topic of working capital management. These studies can be divided into following three categories:

Studies explaining concept & importance

These studies deal with the understanding of working capital management, explanation of its components and importance of working capital in business decisions. For instance, Lamberson (1995) highlighted the importance of working capital. According to him, one of the most significant issues in the business is the management of the working capital; he took the sample of 50 small firms of United States for 12 years time period from 1980 to 1991. Similarly, Mukhopadhyay (2004) stated that working capital is necessary for the firms to keep up its liquidity and productivity. According to Padachi (2006), efficiency of management of WC is important for the survival, success and achievements of organization to boost the performance and input to economic growth.

Few authors have also discussed the strategies of working capital management. For example, Afza and Nazir (2007) discussed that the policies of working capital management may either be conservative or aggressive. In conservative policy, firms use more capital as current but in aggressive policy, firms place less amount of capital in current assets. For determining the degree of aggressiveness, they studied 208 public limited companies in Karachi stocks exchange (KSE) from 1998 to 2005. Their analysis also suggests that there is an inverse link between profitability and the degree of aggressiveness of those policies.

Studies explaining the relevancy with profitability

Such studies investigated the role of working capital management and its components in the profitability of firms. According to the views of Viskari, Pirttila and Karri (2011), working capital has a necessary part in term of short-term investment and cash flow. For their research they studied various components of management of WC including, inventories, accounts receivable and account payables. These all components of management of WC have positive relation with the productivity of the firms.

From Eljelly's (2009) point of view, the effective management of WC are engaged with arrangement, controlling and planning of short term assets and short term liabilities in such a way that elimination of lack of ability of risk, and fulfill short-term obligations with the avoidance of excessive savings in short term assets, and to pay back the short term debts of the firms, effective management of working capital de motivates the needs of lending funds. Afza and Nazir (2007) states that firm's growth opportunities and return to shareholder increases when free cash flow is increases and free cash flow only increases when the use of working capital become efficient. Gill, Biger and Mathur (2010) studied 88 companies of New York for the period from 2005 to 2007; they found that if the period of collection of an account receivable is longer than profitability of the firm will low.

Studies explaining the negative impact on profitability

These studies, though explaining relationship, argued the adverse results on profitability. Siddiquee and khan (2009) highlighted that in efficiency of management of working capital not only decreases productivity but also lead the firm toward financial crises. Thus each organization requires mandatory amount of WC. In the views of Danuletiu (2010), profitability has inverse relationship with the components of working capital management. He studied the 20 companies of Alba countries. Gamesman (2007) studied telecom sector and has the same conclusion.

Studies explaining the mixed views on profitability component wise

More detailed analyses are conducted in such researches; and various components are separate regressed and analyzed in the context of profitability of the firms. Tauringana and Afrifa (2013) analyzed on the basis of 133 companies' panel data that accounts receivable and accounts payable management is important for profitability but inventory and cash conversion cycle are not so important. David (2010) performed regression analysis on 30 listed companies in Nairobi stocks exchange (NSE) taking data from 1993 to 2008; and come up with the results that (1) there is highly inverse affiliation between average collection period and profitability, (2) there is highly direct affiliation between the inventory conversion period and profitability, and (3) there is highly direct relation between profitability and average payment period. Lazaridis and Tryfonidis (2006) carried out the study of cash conversion cycle and liquidity relationship of Greece's food sector. They concluded that there is positive relationship among short term ratio (CR), average age of inventory (AAOI), average collection period (ACP) and cash conversion cycle (CCC) and negative relationship among cash conversion cycle (CCC) and average payment period (APP).

Regional studies

Kaur and Singh (2013) conducted research on 164 manufacturing companies from 19 different industries listed in Bombay stock exchange (BSE), from 2000 to 2010 data and found significant effect of working capital management on profitability. Panigrahi and Sharma (2013) took a sample of 263 nonfinancial companies listed in Bombay stocks exchange covering duration from 2000 to 2008. They observed that management of WC has direct relation with the productivity of the firm, whereas in day's inventory and in days accounts payable are negatively correlated with each other. Their result further shows that in day's accounts receivable and cash conversion has positive relationship with each other.

Studies related to Pakistan

Rehman, Afza, Qayyum and Bodla (2010) studied the impact of working capital on the profitability. They researched on manufacturing sector of Pakistan with 10 years panel data. They concluded that the performance of the firm is significantly related to the cash conversion cycle and average age of inventory. It suggested that conservative policy is a better choice in Pakistan. Shakoor, Khan and Nawab (2012) studied the connection between profitability and management of Working Capital on 25 manufacturing companies listed in Karachi stocks exchange (KSE) covering a period from 2001 to 2010. Their results indicate that days inventories outstanding (DIO), quick ratio (QR), debt equity ratio (DER), and that days inventories outstanding (DIO), quick ratio (QR), debt equity ratio (DER), and return on equity (ROE) have positive association with the profitability whereas days sales outstanding (DSO) and short term asset ratio (CR) have negative association with the profitability.

Zubairi (2010) worked on impact of management of Working Capital and Capital Structure on productivity in the automobiles sector of Pakistan. According to him, the profits figures like net profits, investment, financing and operating activities, are subjective by management choice and also the environmental issue either they are internal or external. Short term ratio, size of the firm and leverage ratio was taken as variables of this research. Supplementary analysis is used for the variability of the variables. After the analysis they concluded that those major elements have positive correlation between them and in the end they also suggested that how firm's managers of automobiles sector should take action to enhance the profitability by using efficient management of WC. Ahmed (2007) made an investigation to found the impact of management of WC and the productivity of the firm for nonfinancial

companies listed in Karachi Stock. The sample size was 253 companies. Pearson correlation and OLS regression techniques are used for analyses. Results indicated that there is negative relationship of both, return on assets (ROA), and return on equity (ROE) with working capital management.

Variables used in the studies

There are various ingredients of working capital like cash, cash equivalent, debtors, creditors, inventories, running finance, prepaid, short term accruals etc. All these components are then used in various accounting ratios to portray the clear picture of working capital position and management. Different studies used different accounting ratios not only for working capital management but also for company's financial performance. For instance, Sohail, Zaman and Alam (2011) studied panel data of 14 Pakistani companies from 2004 to 2009. They used Short Term Asset To Total Asset Ratio (CATT), Current Ratio (CR), Short Term Asset To Total Sales Ratio (CATT), Liquidity Ratio (LR), Inventory Turnover Ratio (ITO), Debtors Age (AOD), And Creditor Age (AOC) as Predictor Elements and they used only one Dependent Variable of Return On Investment.

In another study by Afza and Nazir (2007), they used short term liabilities to short term asset ratio (CLAR) and short term asset to total asset ratio (CAAR) and for measurement of the impact of those policies on the presentation of the firm's productivity, Return on Capital (ROC) and Return on Asset (ROA) is used. While study conducted by Rehman et al. (2010) used inventory age, payable turnover in days, account receivable turnover in days, cash ratio, current liability to total assets, working capital turnover ratio, current assets to total assets turnover, growth in sales, company (as log of sale) and debt ratio as explanatory variables and profit after tax as explained variable.

Danuletiu (2010), in his research, used net working capital to find the financial position, working capital, as an indicator of liquidity and treasury as a difference of both, net WC and working capital necessities. Return on assets (ROA), return on sales (ROS) and return on equity (ROE) were applying to measures the effectiveness of the firms. According to the Gamesman (2007) optimization of WC balance is minimizing the WC requirement and realizing maximum achievable revenue. He conducted his study on the sector of telecommunication and equipment industry by taking 349 firms for seven years. He used various variables for his research as days of sales outstanding (DSO) inventory turnover in term of days, creditor turnover, working capital turnover, cash cycle, profit to assets ratio, net profit margin and liquidity ratio. He concluded his study as; in this industry there is an inverse connection between management of WC and prosperity of the firm.

Variables used in the studies

In the abovementioned studies, there are some accounting ratios, which are used frequently by the researchers to represent working capital management. Different nomenclatures are also used for the same ratios like inventory age and days inventory outstanding are same. Similarly, there are few ratios that calculate same components but with different angle such as, Debtor age and Account receivable turnover, both calculate receivable management efficiency but one ratio define it in days while other ratio in times. These ratios with single nomenclature are listed below:

- Working Capital Cash Conversion Cycle (CCC)
- Net WC To Total Assets(NWCTA),
- Net WC Turnover (WCTO),

- Inventory Turnover(ITO),
- Debtor Turnover(DTO),
- Short Term Assets Turnover(CATO),
- Inventory Age (AOI),
- Debtor Age (AOD),
- Creditor Age (AOC),

RESEARCH METHODOLOGY

Data sampling

For this study, authors have selected 18 companies from cement sector listed in stock exchange; 5 year secondary data from 2007 to 2011 is collected from Karachi stocks exchange (KSE) and firm's official websites. Data validation is done through website of State Bank of Pakistan (SBP). "EVIEWES 7" software is used in this research paper. Local as well as international literatures are used to develop the foundation of this research paper. Following variables for measurement of working capital and profitability of the companies:

Dependent variables

- Return on assets (ROA)

Independent variables

- Days inventory outstanding (DIO)
- Days sales outstanding (DSO)
- Days payable outstanding (DPO)
- Current liabilities to total assets ratio (CLTA)
- Assets turnover ratio (ATO)
- Inventory turnover ratio (ITO)
- Current ratio (CR)
- Size of the firms (SLS)

Variables description

- **Return On Assets (ROA)**

Return on assets (ROA), benchmarking profitability, is the ratio of net income to total assets of the business. It measures the efficiency of the business in using the assets to generate net income.

- **Days Inventory Outstanding (DIO)**

Days Inventory Outstanding (DIO) is an efficiency ratio, showing how long it takes on average to sale inventory once raw material is purchased. This is an important component of working capital.

- **Days Sales Outstanding (DSO)**

Days Sales Outstanding (DSO) is a determinant of average number of days that a firm takes to collect its revenue in cash after a sale has been made. Smaller DSO indicates that a firm collects its accounts receivable in fewer days, whereas longer DSO indicates slower collection.

- **Days Payable Outstanding (DPO)**

Days Payable Outstanding (DPO) is a firm's to be paid period which indicates that how long it takes a firm to pay its payables invoiced by creditors. Lower DPO is considered effective.

- **Short Term Liabilities To Total Assets Ratio (CLTA)**

Short term liabilities to total assets ratio (CLTA) is a liquidity ratio which indicates that short term liabilities as a ratio of total assets.

- **Assets Turnover Ratio (ATO)**

Assets turnover ratio (ATO) is the long term efficiency ratio, showing the relationship between sales and total assets. It indicates that how successfully the firm is using its all assets to generate possible revenue.

- **Inventory Turnover Ratio (ITO)**

This is another measure to show efficiency of the firm in selling its inventory. It gives number of times per period on average the sale is made and replaced it all inventory.

Controlled Variables

- **Current Ratio (CR)**

Current ratio (CR) is a liquidity ratio depicting current asset position as compared to its short term liabilities.

- **Size Of The Firms**

Size of the firms is controlled through volume of net sales of the companies.

Hypotheses

Following hypotheses have been made to conduct "effects of management of WC on firm's performances on the cement sector of Pakistan" research:

H1= Days inventory outstanding (DIO) is significantly affecting the profitability of firm.

H2= Days sales outstanding (DSO) is significantly affecting the profitability of firm.

H3= Days payable outstanding (DPO) is significantly affecting the profitability of firm.

H4= Short term liabilities to total assets (CLTA) is significantly affecting the profitability of firm.

H5= Assets turnover ratio (ATO) is significantly affecting the profitability of firm.

H6= Inventory turnover ratio (ITO) is significantly affecting the profitability of firm.

H7= Current ratio (CR) is significantly affecting the profitability of firm.

H8= Size of the firm (SLS) is significantly affecting the profitability of firm.

Model

Following model is used in this research paper to study the relationship between dependent variable and independent variables.

$$ROA_{i,t} = \alpha + \beta_1 (DIO_{i,t}) + \beta_2 (DSO_{i,t}) + \beta_3 (DPO_{i,t}) + \beta_4 (CLTA_{i,t}) + \beta_5 (ATO_{i,t}) + \beta_6 (ITO_{i,t}) + \beta_7 (CR_{i,t}) + \beta_8 (SLS_{i,t})$$

ANALYSIS

We have used Panel Least Squares Regression with ROA as dependent variable and eight independent variables including working capital indicators and controlling variables. Almost all the variables in the model are in the form of ratio except sales variable, which is used for controlling the size of the firms. Since there is no interpretive significance of the controlling variables as such we including sales at level. There are 18 cross sectional units and 5 year time period from 2007 to 2011. All in all, there are 90 observations. Since this is a multiple regression analysis, we have checked the assumption of multi-collinearity among variables through correlation matrix:

Table 1
Correlation Matrix

Variables	ROA	Sales	C.R	ATO	ITO	DIO	DSO	DPO	CLTA
ROA	1								
Sales	0.4	1							
C.R	0.45	0.2	1						
ATO	0.29	0.16	0.3	1					
ITO	0.09	0.2	-0.01	0.33	1				
DIO	-0.05	0.05	-0.15	0.1	0.91	1			
DSO	-0.01	-0.03	-0.1	-0.03	-0.06	-0.05	1		
DPO	0.24	0.31	0.16	0.32	0.03	0	-0.05	1	
CLTA	-0.5	-0.26	-0.33	0.07	-0.04	0.06	0.06	-0.07	1

The above table found no significant correlation among independent variables as well as correlation between dependent and independent variable except Days inventory outstanding (DIO) and Inventory turnover ratio (ITO), which seems logical, we are not dropping either of the variables as both the indicators of inventory management are simultaneously used in previous studies.

RESULTS

Table 2
Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.597804	2.799223	-0.570803	0.5697
DIO	0.094712	0.179307	0.528211	0.5988
DSO	0.00039	0.000775	0.503498	0.616
DPO	0.059455	0.227242	0.261637	0.7943
CLTA	-20.87882	4.885184	-4.273906	0.0001
ATO	5.586787	2.572756	2.171519	0.0328
ITO	-0.113698	0.179592	-0.633094	0.5285
CR	3.583239	1.593981	2.247981	0.0273
SLS	35.25807	1.506807	2.360419	0.0207

Results can be presented with resultant coefficient values in equation form as follows:

$$ROA_{i,t} = -1.5978 + 0.0947 (DIO_{i,t}) + 0.0003 (DSO_{i,t}) + 0.0594 (DPO_{i,t}) - 20.8788 (CLTA_{i,t}) + 0.5867 (ATO_{i,t}) - 0.1136 (ITO_{i,t}) + 3.5832 (CR_{i,t}) + 35.2580 (SLS_{i,t})$$

DISCUSSION

Current liability, assets turnover ratio (ATO), current ratio (CR) and size of the firm (SLS) have positive and significant affiliation with the return on assets (ROA). Their coefficient values are 5.587, 3.583 and 35.258 respectively having t values greater than 2. These variables are found positive and significant most of times in previous studies like asset turnover is reported positive and significant by Kaur and Singh (2013), and Rehman et al. (2011); whereas current ratio and size of firm are reported positive and significant by Arshad and Gondal (2013). Short term liabilities to total assets ratio (CLTA) got the probability less than 5% with t value of 4.274, which indicates that CLTA has significant relationship with the return on assets (ROA). This relationship is negative with a very high coefficient value of -20.879. This result confirms the third hypothesis this study. Padachi (2006), Edi and Binti (2010), and Afza and Nazir (2007) have also got the same results.

Days sales outstanding (DSO) and Days payable outstanding (DPO) the contribution of both the variables is found insignificant in the profitability of firm according to results; as their t values are 0.503 and 0.262 respectively. Beside significance, the coefficient values, though positive, are too low to consider. Thus, null hypotheses 2 and 3 are also rejected. Similar results are also obtained by Viskari, Pirttila and Karri (2011), Osundina (2014), and Deloof (2003).

Days Inventory Outstanding (DIO) has positive relationship with profitability of the firm with 0.095 coefficient but this variable is not significant as t value is 0.528. This finding is supported by some previous studies like Viskari, Pirttila and Karri (2011), Osundina J.A (2014), Padachi (2006), and Lyroudi and Lazaridis (2000). This result can also be crossed checked by Inventory Turnover ratio, which is another variable used in this model. ITO is also insignificant with negative sign of coefficient. Theoretically speaking, DIO and ITO should have same level of significance because both are related to inventory; and their influences on profitability should be in opposite directions because they are reciprocal to each other. Both the conditions are present in our finds.

CONCLUSION

It can be concluded from the results that asset turnover, current ratio and volume of sale contribute positively in the profitability of cement sector companies of Pakistan. Asset turnover represents how efficiently all the assets are being utilized in the operations to generate sales and it is intuitively understandable that efficient utilization of asset will enhance the production, this will provide an opportunity to increase sales without additional assets, increase in sale will consequently increase profit and this scenario definitely results in higher return on asset ratio. As far as current assets are concerned, result indicates that keeping larger current assets vis-à-vis current liability will enhance the profitability for the firm. Higher current ratio gives an organization more freedom to use its current asset more efficiently. In other words, it can also be said that keeping current liabilities at lower level not only in relation to current asset but fixed asset as well. There is an endorsement of this argument from another result; that is the ratio of current liability with total asset highly influential in the profitability of companies; mere 1% increase in this ratio can reduce the return on assets (ROA) by almost 21%.

The efficiency of account receivable and account payable in working capital management does not affect the profitability of the firm as far as cement sector of Pakistan is concerned. It can also be concluded from results that inventory component of working capital does not have significant association with profitability of the firms. Inventory, account receivable and account payable are the most important elements of working capital and all are found insignificant. Thus, finally it can be inferred from this research that in cement sector of Pakistan, efficiency of working capital management does not play any significant role in enhancing the profitability of firms. Basically, it is the overall efficiency of fixed assets like machinery or plant as well as of current assets from cash to inventory, which is critical in the profitability of firm. This study will be helpful for the Pakistani firms to make effective decision of the management of the working capital to make their firms profitable.

Areas for Future Research

Since this is a panel study, therefore we can analyze fixed and random effects for this working capital model in future to make this model more robust. We can also check significance of working capital factors on other proxies of profitability like return on equity or profit margins with updated set of data.

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