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STATEMENT OF THE PROBLEM

OBJECTIVES

HYPOTHESES

RESEARCH METHODOLOGY

RESULTS & DISCUSSION

FINDINGS

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A STUDY OF IMPACT OF WORKING CAPITAL MANAGEMENT ON FIRM'S PERFORMANCE: EVIDENCE FROM CEMENT INDUSTRY IN INDIA FOR THE PERIOD 2007-2011

ZOHRA ZABEEN SABUNWALA ASST. PROFESSOR INDIRA SCHOOL OF BUSINESS STUDIES PUNE

ABSTRACT

The given study tries to prove a direct relationship of Working Capital Management (WCM) with firm's performance. The challenge for the firm is to decide what the optimum level is and which both the motives of profitability and liquidity can be satisfied. I have focused on to find out the relationship between WCM and firm's profitability WCM measured through Return on Total Assets (ROTA) for the cement industry in India. A sample of 60 cement companies listed on Bombay Stock Exchange has been taken for a period of 5 years (2007-2011) that is 300 firm-years.

KEYWORDS

Working Capital Management, Profitability, Return on Total Assets, Cement Industry.

INTRODUCTION

orking capital management is of prime importance for every firm. WCM has direct linkage with firm's profitability and liquidity. It is most important for every firm to meet its working capital requirements at all points of time to maintain liquidity and at the same time to keep optimum level of current assets and current liabilities in place so as not to impact profitability. Gitman (1974) argued that the cash conversion cycle was a key factor in working capital management. Actually, decisions about how much to invest in the customer and inventory accounts, and how much credit to accept from suppliers, are reflected in the firm's cash conversion cycle, which represents the average number of days between the date when the firm must start paying its suppliers and the date when it begins to collect payments from its customers. Previous studies have used measures based on the cash conversion cycle to analyze whether shortening this cycle has positive or negative effects on the firm's profitability. Empirical evidence relating working capital management and profitability in general supports the fact that aggressive working capital policies enhance profitability (Jose et al., 1996; Shin and Soenen, 1998; for US companies; Deloof, 2003; for Belgian firms; Wang (2002) for Japanese and Taiwanese firms). This suggests that reducing working capital investment is likely to lead to higher profits. In this study, I will try to find out the impact of working capital management on profitability (measured through ROTA) for the Indian Cement Industry for the period from 2007-2011 to understand this relationship.

REVIEW OF LITERATURE

LITERATURE REVIEW: WORKING CAPITAL MANAGEMENT AND PROFITABILITY

Moussawi et al in Corporate working capital management: Determinants and Consequences mainly focused on determining the relevance of the core factors to the efficiency of a firm's Working capital management. According to their findings, Working Capital efficiency positively and significantly impacts firm size, executive compensation, future firm sales growth, the proportion of outside directors on a Board, industry practices and it negatively and significantly impacts CEO share ownership. They also found that Working Capital efficiency unrelated with industry concentration. On the contrary, Filbeck⁷ in An Analysis of Working Capital Management Results Across Industries found that Significant differences exist between industries across time with respect to measures of working capital measures and that working capital measures for a given firm are not static, and significant differences in these measures exist across time.

Deloof in Does Working Capital Management(WCM) Affect Profitability of Belgian Firms investigated the impact of WCM on corporate profitability by taking 2000 most important Belgian firms for the period 1991-1996 and found that Gross operating income negatively and significantly impacted by number of days accounts payable, number of days inventories, number of days accounts receivable but positively and significantly impacted by firm size (measured by the natural logarithm of sales), sales growth and fixed financial assets, and decreases with financial debt. Padachi in Trends in Working Capital Management and its Impact on Firms' Performance: An Analysis of Mauritian Small Manufacturing Firms examined the impact of accounts receivables days, inventories days, accounts payable days and CCC on Return on Total Assets (ROTA) for a sample of 58 small manufacturing companies for the period of 1997-98 to 2002-03 and found that ROTA is significantly positively and significantly affected by Operating Profit Margin and capital-turnover ratio, but negatively and significantly impacted by the measures of WCM.

The above findings were also supported by Raheman and Nasr in Working Capital Management And Profitability – Case Of Pakistani Firms and they also found that Net Operating profitability is significantly negatively impacted by measures of elements of WCM i.e. Average Payment Period, Inventory turnover in days, Average Payment Period and Cash Conversion cycle.

Another important findings by Lazardidis and Tryfonidis in Relationship between working capital management and profitability of listed companies in the Athens stock exchange on the relationship between working capital management and profitability of listed companies in the Athens stock exchange for a sample of 131 companies listed on Athens stock exchange for a period of 2001-04 also found that CCC is significantly negatively related with profitability.

Mukhopadhyay in Working capital management in heavy engineering firms studied the effectiveness of working capital management of a firm with particular reference to its short term liquidity and solvency and impact on commercial operations of the organization and found that Gross working capital is significantly positively related with Inventory, Debtors and Receivables, Loans and Advances, Other current Assets and Net working capital and significantly and negatively related with current Liabilities and provision. The study also found significantly negative relation with current liabilities and provisions.

CEMENT INDUSTRY IN INDIA

Cement industry has a vital role to play in the infrastructural and economic development of any country. India is a fast developing country providing enormous scope for the development of cement industry. The cement industry in India had been completely under the supervision and control of the government but after the economic reforms, the scenario has changed significantly. But still the government plays a major role in regulating the prices.

Demand for cement depends on industrial activity, real estate and construction activity. Indian cement industry has grown largely due to the rising demand from the housing sector, increased activity in infrastructure and construction recovery. Even in the tough conditions, Indian cement industry has been able to sustain its growth. Production and capacity of cement has been rising over the years.

Cement industry has a large number of fragmented firms. The large firms are consolidating by acquiring smaller players ones. High debt levels have adversely impacted the profitability of several cement companies.

According to a report by Department Related Parliamentary Standing Committee on Commerce (2011), the performance of cement industry has been commendable even during the global economic slowdown. The sector has survived the adverse impact as public spending on infrastructure projects remained optimum, keeping in view its multiplier effects to spur the economy. There is an interlinking relation between cement consumption and the growth of economy. The country is on a high growth track and the focus now is on the development of the infrastructure facilities such as, highways, ports, canals, bridges, powerhouses etc. Infrastructural development obviously gives rise to increased demand for cement.

TABLE 1: ANNUAL DEMAND, PRODUCTION & EXPORT FIGURES FOR CEMENT INDUSTRY

in Million Tonnes Production Year Demand of Export of Cement of Cement Cement 2005-06 135.56 141.81 5.98 5.89 2006-07 149.34 155.64 2007-08 164.03 168.31 3.65 2008-09 177.98 181.61 3.20 2009-10 196.12 201.00 2.27

Source: Department Related Parliamentary Standing Committee on Commerce

NEED/IMPORTANCE OF THE STUDY

WCM has got a lot of emphasis in financial management of the firms. A greater extent of profitability of a firm is determined by the components of working capital management like Accounts Receivable, Accounts Payable and Inventory and Cash Conversion Cycle. Thus, it is very important to understand the relationship between working capital management and its impact on profitability of the firm. The given study will measure the impact of WCM on profitability of cement firms to understand the dynamics of liquidity management on profitability.

STATEMENT OF THE PROBLEM

To study the impact of the various components of working capital like account receivable, account payable, inventories days & cash conversion cycle, and log sales, gearing ratio on return on total assets (ROTA).

OBJECTIVES OF THE STUDY

- 1. To examine the impact of various components of working capital like account receivable, account payable, inventories days and cash conversion cycle on return on total assets (ROTA)
- 2. To examine the impact of firm size measured by natural log of sales on return on total assets (ROTA)
- 3. To examine the impact of leverage measured by gearing ratio on return on total assets (ROTA)
- 4. To analyze the trend in working capital needs of the firms in cement sector

HYPOTHESIS

- 1. H0: Cash Conversion Cycle does not significantly impacts the ROTA of cement firms listed on Bombay Stock Exchange
- 2. H0: Accounts Receivable days does not significantly impacts the ROTA of cement firms listed on Bombay Stock Exchange
- 3. H0: Accounts Payable Days does not significantly impacts the ROTA of cement firms listed on Bombay Stock Exchange
- 4. H0: Days Inventory does not significantly impacts the ROTA of cement firms listed on Bombay Stock Exchange
- 5. H0: Firm Size does not significantly impacts ROTA of cement firms listed on Bombay Stock Exchange
- 6. H0: Higher leverage does not significantly impacts the ROTA of cement firms listed on Bombay Stock Exchange

RESEARCH METHODOLOGY

The primary objective of this paper is to investigate the impact of Working Capital Management (WCM) on profitability of Indian Cement Industry. This is achieved by using the similar empirical framework as used by Shin and Soenen14 (1998), Deloof15 (2003) and later by Padachi16 (2006). The study uses secondary data to analyze and interpret the results. The paper also tries to understand the trends in the working capital needs of the cement sector over the period of time considered in the study. The study mainly focuses on cement industry in India which includes firms that are registered and listed on Bombay Stock Exchange (BSE). The empirical study is based on the sample of 60 firms in cement industry that are listed on BSE and have their annual reports filed with BSE for the period of 5 years from 2007-2011 in the study. This gives the set of 300 firm-year observations for a sample of 60 firms.

EXPLANATORY VARIABLES & CONTROL VARIABLES

RETURN ON TOTAL ASSETS

For the purpose of this study, profitability is measured by Return on Total Assets (ROTA) as this ratio best captures the profitability as it captures the return the firm generates on the total funds invested. This ratio also brings the firms with different asset bases and earnings on the same platform making them comparable. This acts as a dependent variable for the study.

ROTA = Earnings before Interest Depreciation amortization and Taxes (EBITDA)

Total Assets (TA)

Following are the independent/ explanatory variables used in the study to get a better understanding of Working Capital in these companies.

LOG SALES

The log transforms is taken for the sales value in order to obtain the normal plots. By this we have normalized the sales value so that our data can be appropriately used for the purpose of analysis. Many a times the data are Heteroskedastic, that is, the estimation error is not random; it increases predictably with some variable. The log transform is a common method of fixing this issue.

GEARING RATIO

The Gearing Ratio measures the percentage of capital employed that is financed by debt and long term finance. The higher the gearing, the higher the dependency is on borrowings and long term financing. The lower the gearing ratio, the higher the dependency is on equity financing. Traditionally, the higher the level of gearing, the higher the level of financial risk due to the increased volatility of profits.

Gearing ratio = Long Term Debt

Total Equity

CURRENT LIABILITIES TO TOTAL ASSETS

This ratio gives us the ratio of the Current Liabilities to the Total Assets of the firm. This ratio has been used to compare the Current Assets to Total Assets ratio and have a clear picture of what portion of the assets are invested as current assets and compare the same with this ratio.

Current Liabilities to Total Assets = <u>Current Liabilities</u>

Total Assets

CURRENT ASSETS TURNOVER RATIO

It shows the management's efficiency in employing funds invested in Current assets. The formula is the following:

Current Assets Turnover Ratio = Sales

Average current assets (stocks + debtors + cash & cash equivalents)

INVENTORY TURNOVER RATIO

A ratio showing how many times a company's inventory is sold and replaced over a period.

Inventory Turnover Ratio = Cost of Goods Sold
Average inventory

COGS (cost of goods sold) is taken because sales are recorded at market value, while inventories are usually recorded at cost. Also, average inventory may be used instead of the ending inventory level to minimize seasonal factors.

DAYS INVENTORY

This ratio identifies the average length of time in days it takes the inventory to turn over. As with inventory turnover (above), fewer days mean that inventory is being sold more quickly.

Days Inventory = 365 Days

Inventory Turnover

ACCOUNTS RECEIVABLE TURNOVER RATIO

Many businesses need to sell their goods on credit, otherwise they might find it difficult to survive if their competitors provide such credit facilities; this could mean losing customers to the opposition. This ratio indicates how well accounts receivable are being collected. If receivables are not collected reasonably in accordance with their terms, management should rethink its collection policy. If receivables are excessively slow in being converted to cash, liquidity could be severely impaired.

Accounts Receivable Turnover = Net Credit Sales

Average Receivable

ACCOUNTS RECEIVABLE COLLECTION PERIOD

This reveals how many days it takes to collect all accounts receivable. As with accounts receivable turnover (above), fewer days means the company is collecting more quickly on its accounts.

Accounts Receivable Collection Period =

365 Days

Accounts Receivable Turnover

ACCOUNTS PAYABLE TURNOVER

This ratio shows how many times in one accounting period the company turns over (repays) its accounts payable to creditors. A higher number indicates either that the business has decided to hold on to its money longer or that it is having greater difficulty paying creditors.

Accounts Payable Turnover =

Cost of Goods Sold

Accounts Payable

DAYS PAYABLE

This ratio shows how many days it takes to pay accounts payable. This ratio is similar to accounts payable turnover (above.) The business may be losing valuable creditor discounts by not paying promptly.

Days Payable = 365 days

Accounts Pavable Turnover

CASH CONVERSION CYCLE

The cash conversion cycle is the number of days between paying for raw materials and receiving cash from selling goods made from that raw material. It is the duration between the purchase of a firm's inventory and the collection of accounts receivable (Wikipedia).

Cash Conversion Cycle = (Average Stockholding Period) + (Average Receivables Processing Period) – (Average Payables Processing Period)

Average Stockholding Period (in days) = Average Stock / COGS * 365

Average Receivables Processing Period (in days) = Accounts Receivable / Average Credit Sales*365

Average Payable Processing Period (in days) = Accounts Payable / Average Credit Purchases*365

CURRENT RATIO

Current Ratio measures a company's ability to pay short-term obligations.

Current Ratio =

Current Assets

Current Liabilities

This ratio is mainly used to give an idea of the company's ability to pay back its short-term liabilities (debt and payables) with its short-term assets (cash, inventory, receivables).

The current ratio can give a sense of the efficiency of a company's operating cycle or its ability to turn its product into cash. Companies that have trouble getting paid on their receivables or have long inventory turnover can run into liquidity problems because they are unable to alleviate their obligations.

OUICK RATIO

The quick ratio measures a company's ability to meet its short-term obligations with its most liquid assets. The quick ratio is calculated as:

Ouick Ratio =

<u>Current Assets – Inventories</u>

Current Liabilities- Bank Overdraft

This ratio is also known as acid-test ratio or quick assets ratio.

The quick ratio is more conservative than the current ratio, a more well-known liquidity measure, because it excludes inventory from current assets. Inventory is excluded because some companies have difficulty turning their inventory into cash. In the event that short-term obligations need to be paid off immediately, there are situations in which the current ratio would overestimate a company's short-term financial strength.

WORKING CAPITAL TURNOVER RATIO

A company uses working capital (current assets - current liabilities) to fund operations and purchase inventory. These operations and inventory are then converted into sales revenue for the company. The working capital turnover ratio gives an indication as to how much money is used to fund these operations and the sales revenue generated from these operations. The higher the working capital turnover, the better it is considered because it means that the company is generating a lot of sales compared to the money it is investing to achieve this sales.

Working Capital Turnover Ratio = Sales

Working Capital

DATA COLLECTION

The study is based on secondary data and uses a sample of 60 cement companies listed on Bombay Stock Exchange. The data has been collected for a period of 5 years from 2007 to 2011. The data set has been filtered for the non availability of information on key parameters. Hence out of the total approximately 92 firms listed on BSE, we have got a sample of 60 firms. The total firm-year observation thus stands at 300.

RESULTS & DISCUSSION

We will be applying linear multiple regression model to investigate the impact of working capital management on profitability. We will also find the correlations among the various independent variables and the dependent variable which in this case is ROTA. We will be using SPSS to see the extent to which the given independent variable impacts the ROTA and what is the type of relation whether positive or negative. The model used for the regressions analysis is adopted from Trends in Working Capital Management and its Impact on Firms' Performance: An Analysis of Mauritian Small Manufacturing Firms by Kesseven Padachi. It is expressed in the general form as given in equations below and the variable ivndays will be replaced turn by the other explanatory variables: ARdays, APdays and CCC. The relationship of WCM with profitability will be measured through two models:

The first one takes into account individual elements of WCM (ivn_days, ardays and apdays) and control variables like ln_sales, gearing ratio, CL/TA , CA Turnover.

2. The second equation replaces individual elements with Cash Conversion Cycle. ROTA 1 = β 0 + β 1 ln_sales+ β 2 gear+ β 3 clta+ β 4 turnca+ β 5 invdays+ β 6 ardays+ β 7 apdays+ ϵ 8 ROTA 2 = β 0 + β 1 ln_sales1 + β 2 gear + β 3 clta + β 4 turnca + β 8 CCC + ϵ 8

DESCRIPTIVE STATISTICS

TABLE 2: DESCRIPTIVE STATISTICS

	Mean	Std. Deviation	N
Return on Total Assets (ROTA)	.4224	.22154	300
Natural Log of Sales (Ln_sales)	6.6746	1.12903	300
Debt equity ratio (D/E)	2.3883	5.83250	300
Current Liabilities/ Total Assets (CL/TA)	.4403	.27412	300
Current Assets Turnover Ratio (CA_Turn)	3.0852	2.66635	300
Inventory days (Inv_Days)	184.96	341.692	300
Average Receivable days (AR_Days)	108.88	130.512	300
Average Payable Days (AP_Days)	140.85	137.209	300
Cash Conversion Cycle (days) (CCC)	152.99	411.028	300

Source: Results of panel data from SPSS

CORRELATION ANALYSIS

TABLE 3: PEARSON CORRELATION COEFFICIENTS

		ROTA	Ln_Sales	D/E	CL/TA	CA_TURN	INV_DAYS	AR_DAYS	AP_DAYS	CCC
ROTA	Pearson Correlation	1.000	.224**	059	165**	.577**	438**	591**	321**	440**
	Sig. (2-tailed)		.000	.158	.048	.000	.000	.000	.000	.000
	N		300	300	300	300	300	300	300	300
Ln_Sales	Pearson Correlation		1.000	012	042	.437**	134**	278**	196**	117
	Sig. (2-tailed)			.376	.147	.000	.036	.001	.003	.061
	N			300	300	300	300	300	300	300
D/E	Pearson Correlation			1.000	154**	071	059	.017	012	039
	Sig. (2-tailed)				.012	.152	.198	.402	.432	.284
	N				300	300	300	300	300	300
CL/TA	Pearson Correlation				1.000	178**	.210**	.169**	.332**	.117**
	Sig. (2-tailed)					.005	.001	.007	.000	.044
	N					300	300	300	300	300
CA_TURN	Pearson Correlation					1.000	367**	518**	351**	356**
	Sig. (2-tailed)						.000	.000	.000	.000
	N						300	300	300	300
INV_DAYS	Pearson Correlation						1.000	.756**	.354**	.940**
	Sig. (2-tailed)							.000	.000	.000
	N							300	300	300
AR_DAYS	Pearson Correlation							1.000	.397**	.840**
	Sig. (2-tailed)								.000	.000
	N								300	300
AP_DAYS	Pearson Correlation								1.000	.131
	Sig. (2-tailed)									.106
	N									300
CCC	Pearson Correlation									1.000

^{(**} significant at 0.05 confidence level)

Source: Results of panel data from SPSS

Table 3 presents Pearson correlation coefficients for the variables and they are used to assess the direction and extent to which one variable is linearly associated to another variable. Here we measure the impact of independent variables of working capital management on profitability, as measured by return on total assets (dependent variable).

ROTA is significantly positively correlated with CA turnover ratio, natural log of sales but negatively correlated with elements of WCM viz. accounts receivable days, accounts payable days, inventory days and CCC. Also ROTA shows negative correlation with gearing ratio (D/E ratio), and CL/TA. The positive relation for ROTA with CA turnover is consistent with the view that operational efficiency is directly related to profitability. The better the utilization of current assets in generating sales better are the prospects of profitability. Also, the positive correlation of sales with ROTA is obvious from the fact that higher the sales, higher the profits.

Negative correlation of working capital elements with ROTA can be explained from the fact that larger the cash conversion cycle, longer are the resources tied up at the different stage of the supply chain, and thus elongating the time in which returns can be generated otherwise, hence lowering the profitability in due course of time. Like, the costs of tied up capital in holding more inventories may lower the benefits generated due to holding higher stocks. Granting more trade credit to customers for longer time period may result in slower recovery and higher chances of bad debts. In some cases, trade credit from the suppliers may be for shorter time period to enable the firm to reap the benefits of the time gap between repaying the suppliers and recovering money from the buyers of goods. This may also explain for the negative correlation of ROTA with CL/TA.

REGRESSION EQUATIONS

ROTA= 126.315 + 0.974x1 - 0.012x2 - 0.095x3 + 0.062x4 - 0.792x5 - 0.009x6 - 0.387x7.....(1) ROTA= 86.815 + 0.989x1 - 0.012x2 - 0.098x3 + 0.069x4 - 0.364x8.....(2)

TABLE 4: REGRESSION OF PROFITABILITY ON WORKING CAPITAL VARIABLES

Dependent Variable:	Return on Total Assets			
Regression Model:	1	П		
Ln_Sales (x1)	0.974**	0.989**		
	(.000)	(.000)		
Gearing ratio (x2)	012**	012**		
	(.002)	(.000)		
CL/TA (x3)	095**	098**		
	(.043)	(.041)		
CA_TURN (x4)	.062**	.069**		
	(.005)	(.005)		
INV_DAYS (x5)	792**			
	(.000)			
AR_DAYS (x6)	009**			
	(.000)			
AP_DAYS (x7)	387**			
	(.000)			
CCC (x8)	-	364**		
		(.000)		
Adjusted R ²	.522	. 467		

Source: Results of panel data from SPSS

The first model of regression explains the variability best as the value of adjusted R^2 is the highest at 52.2% where all the three individual elements of cash conversion cycle have been used. In case of second model, the three elements of Working Capital have been replaced by cash Conversion Cycle and has the adjusted R^2 is 46.7%.

The Ln sales and CA Turn are significant and positively related which shows that as the firms' sales increases; working capital efficiency also increases.

The use of long term funds in WCM of the firms as shown by gearing ratio also come as significant and reveals the lesser use of long term funds in WCM of firms helps increase the profitability. This also points to the fact that cement firms have been relying more on short term assets to meet their WC needs. The decreasing CL/TA also points towards the same thing that firms now rely more on short term loans and credit to meet their short term demands.

The positively and significantly related CA turnover ratio also indicates that the Current Assets are fast moving and not stagnant and higher the current asset movement with respect to sales more is the profitability.

The Inv_days, AR days, AP days and ultimately CCC in the two regression models respectively shows that these variables have significant impact on WCM profitability. All the four elements of WCM show significant negative correlation. On the basis of P-value of 0.000, we reject the null hypothesis that the elements of working capital management (CCC, AR days, AP days, Inv_days) have no statistical significant effect on the profitability. Our findings are in tandem with the results for the previous study where CCC was negatively and sig related to profitability.

The models also reject the null hypothesis that firm size has no statistically significant effect on the profitability and the positive sign of the coefficient points to the fact that as the firms' size increases, its profitability also increases.

The models also reject the null hypothesis that gearing ratio (Debt-Equity ratio) has no statistically significant effect on the profitability and the negative sign of the coefficient points to the fact that as the cement firms depends less on long term funds meeting their WC requirements and depends more on short term credit from suppliers. This could be possible in this industry because of the strong supply chain management emerging in this industry.

CONCLUSIONS

- 1. Working Capital elements (Accounts payable days, Accounts Receivable days, inventory days and eventually the Cash Conversion Cycle) significantly impacts the profitability of the cement firms.
- 2. The lower the cash conversion cycle, higher is the profitability as measured by the ROTA and vice versa.
- 3. As the size of cement firm increases, the profitability also increases.
- 4. Gearing Ratio is significantly and negatively related with ROTA and that cement firms depend less on long term funds and depends more on short term supplier's credit as the Current Liabilities to Total Assets is high and significant.
- 5. The Current Assets turnover ratio is also significant and positive and points to the fact that the higher the efficiency (the usage of current assets in generating sales) the higher the ROTA is.

LIMITATIONS

- 1. The data might not be available for certain parameters involved in the study.
- 2. Some specific sectors/ industries may be left out to be studied under this research.
- 3. The results and findings might not be true for smaller firms with less of capital and funds at hand

SCOPE OF FURTHER RESEARCH

The study mainly concentrates on the working capital management of cement industry and its impact on profitability of the cement companies. The study can be further extended to other industries like steel, automobiles, infrastructure, logistics etc. to establish the impact WCM has on the profitability. Also, more factors can be added along with WCM variables likes capital structure, Assets turnover, Solvency ratios etc. to give a better model which explains the profitability.

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