

# Impact of capital structure on firm's profitability and shareholder wealth maximization: A study of listed Indian cement companies

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**Abstract:** The capital structure decision is the imperative one since the profitability of the firm is specifically influenced by such decision. It is redundant that benefit ought to be the main target for a business. Profit maximization is part of the wealth creation process. Where, wealth maximization is a long haul process. It alludes to the value of the firm and it is expressed in the value of stock. Hence, this study has aimed at investigating the impact of capital structure on the profitability and shareholder wealth of the listed cement manufacturing companies using a panel data methodology. The study considered all the listed cement manufacturing companies on the National Stock Exchange over the past 8 years. To analyze the data various statistical techniques include descriptive statistics, correlation analysis and regression analysis were used. Two kinds of variables were used in the study. Dependent variables are Return on Asset, Tobin's q ratio to measure market value and EPS to measure shareholder wealth. Where, the independent variables were leverage, debt to equity ratio, total liability, size and rate of growth in sales. Our results showed that the capital structure (debt-equity ratio) positively impact the firm's profitability, market value and shareholder wealth but statistically this relation is not significant. This study is significant in that it will add to the already existing literature on the impact of capital structure on the firm's profitability and shareholder wealth.

**Keywords:** Capital structure, Debt to equity ratio, Firm profitability, Panel data, Shareholder wealth

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## I. Introduction

In the current scenario of business, firm's objective is to maximize the shareholder esteem. Wealth of shareholders are inferred mostly from stock price changes over a period and dividends paid. To accomplish this, the firm ought to view point of its impact on the value of the firm. There exist numerous components which affect the firm value and shareholder wealth. In such variables capital structure is one. Wherever, the firm needs to raise finance to invest in projects. Further, the future cash flows of the projects will enhance the firm's value and hence. Enhance the shareholder wealth. This involves a capital structure decision because it has to decide the amount of finance to be raised as well as the source from which it is to be raised.

The Capital structure is referred as the combination of debt and equity used to finance a firm's investment opportunity. The combination can be a mix of debt and equity. Equity may be from the internally generated equity and new equity. But what is the right combination? Is this still a debatable question among many researchers and academicians mind. For many years, both researchers and academicians are performing hypothetical and experimental studies on capital structure and proposes that there is an optimal capital structure, that one that maximizes the value of the firm and simultaneously minimizes the cost of capital. The capital structure choice is a noteworthy managerial decision which impacts the risk and return of the shareholders. Financial decisions taken by the managers without any future plan of financial activities to full fill their projects will thrive in the short run, yet when it's all said and done, they may confront extensive troubles in raising funds to finance their future activities. Any immature capital structure choice can bring about the high cost of capital, subsequently, bringing down the firm's value. Deciding the optimal capital structure is one of the essential obligations of finance manager. Managers are encouraged to act more in the interest of shareholders and the amount of leverage in the capital structure affects firm profitability (Ebaid, 2009).

The profitability of the firm depends on the firm's investment opportunities. They can invest using the total debt, equity or a combination of debt and equity. This depends not only investment expected future cash flows, but also on the cost of these funds.

Profitability is one of the essential criteria for pulling the shareholders to contribute in raising the funds for the firm. Profitability has been measured in this paper by Return on Assets (ROA). The study seeks to explore whether profitability (ROA) is related to capital structure. Further, this study aims to examine the relationship between shareholder wealth and capital structure and also market value of the firm and capital structure in the Indian cement industry. This study considered a sample of 18 firms for the period 2007 – 2014. Applying panel data regression analysis, we discovered mixed result about the relation between them.

The rest of this paper is organized as follows: the following section gives a summary review of the related literature. The next section describes the research method. The subsequent section presents the analysis and results of empirical work.

## **II. Literature Review**

A thorough literature review has been made by us while conducting the study. Different variables utilized by us in the study have been extricated after scanning through various literature. It is proposed to introduce briefly some of the research studies conducted by distinctive researchers relating to the present study.

A number of empirical and theoretical studies investigate the determinants of capital structure. For instance, (Karadeniz, Kandir, Balçilar, & Onal, 2009) have concentrated on the variables deciding the capital structure of Turkish lodging companies listed in the Istanbul Stock Exchange. They found that leverage is negatively related to the firm's performance (ROA). While the firm size didn't demonstrate any significant relation to the capital structure. Similar results found by (Rajan & Zingales, 1995). In contrast, (Hol & Wijst, 2008) analyze the determinants of capital structure in unlisted firms of Norway over the study period 1995 to 2000. They find that profitability is positively related to leverage. (Amidu, 2007) has inspected the determinants of the capital structure of banks in Ghana using multiple regression model to comprehend the distinctive variables affecting the capital structure choices. He finds that profitability, growth, asset structure, tax rate and size of the bank determine the capital structure of banks in Ghana. A similar study has been done by (Deari, 2010) who found profitability, size, growth, and tangibility influence the capital structure choices.

In another study, (Antwi, Fifi, Atta, Polytechnic, & Kf, 2012) investigated the relation between capital structure and firm performance among 257 South African firms over the period 1998-2009. They found a positive and significant relation between leverage and firm's performance using the GMM regression approach. Comparable results were found by (Ramezani, Hasan, Nezhad, & Majd, 2013) in the Tehran Stock Exchange and (Margaritis & Psillaki, 2010) in the French firms for the period of 2003-05. (Hasan, Ahsan, Rahaman, & Alam, 2014) has researched the effect of capital structure on the firm's performance using a sample of 36 firms in Bangladeshi firms for the period of 2007-2012. They found that EPS is significantly positively related to short term debt and negatively related to long term debt. Further they found significant negative relation between capital structure and ROA using the pooling panel data regression method. (Zeitun, R., 2007) has attempted to inspect the relation between the profitability (ROA) of the firm and Capital structure further more market value (Tobin's Q) and capital structure of firms in Jordan. They concluded that the capital structure of the firms has a significantly negative impact on the firm's financial performance. Similar results found in (Ebaid, 2009) study of a sample of non-financial firms in Egypt over a period of 1997 to 2005 and (Salim & Yadav, 2012) observe similar results. Further, they found market value (Tobin's Q) has a significant positive relation with debt levels of the firm. In contrast, (San & Heng, 2009) have concluded from their study there exists a significant relationship between the capital structure and profitability of the firm (ROA).

Although, there is some evidence on determinants of capital structure of cement firms (e.g. (Hijazi & Tariq, 2006)). Hijazi & Tariq (2006) investigate the determinants of capital structure of 16 firms in cement industry over the period 1996 to 2001. They found a positive relationship between leverage and growth. Whereas leverage was found negatively associated with profitability and size of the firms.

In summary, empirical studies with respect to the relationship between capital structure and firm's performance measured by ROA, EPS & Market value (Tobin's Q) in different studies provided mixed and contradictory evidence. The present study extends the literature on the impact of capital structure on the firm's performance and shareholder wealth in the Indian cement industry and managers of the cement companies can improve their decision making skills by identifying the optimum capital structure.

## **III. Research Method**

### **3.1. Sample and Data**

This study was conducted based on the secondary data of the selected companies of the Indian cement industry. Our study mostly considers firms listed and permitted to trade in the BSE and NSE were determined during the period 2007 to 2014. Our sample consists of 18 firms includes both major and minor cement firms in India. The data needed for this study have been taken from the Capitaline Plus database.

### **3.2 Variables Measurement**

#### **3.2.1 Dependent Variables**

Literature uses several of diverse measures of a firm's performance, this study uses measures include accounting based measure of profitability ROA, market based measures such as stock returns (EPS) and Tobin's Q which measure the market value of the firm as dependent variables. The measurement of return on assets (ROA) is computed as the ratio of profit after taxes over the total assets. Where EPS is calculated as

$$EPS = \left( \frac{NetProfit - DividendTax}{EquityPaidUp} \right) * Facevalueofequity$$

And Tobin's Q is the ratio of the firm's market value of assets to the replacement cost of the firm's assets.

$$Tobin'sQ = \frac{MarketValueofAssets}{BookValueofAssets}$$

**3.2.2 Independent Variables**

Debt Equity ratio – it indicates what proportion of equity and debt the firm is using to finance its assets.

$$Debt - Equityratio = \frac{TotalDebt}{ShareCapital + Reserves}$$

Liabilities – the company's total liabilities are the sum of the short and long term liabilities such as loans. Leases and taxes, etc.

Leverage – it is the ratio of total debt to total assets.

Control Variables – previous research suggests that firm's size and rate of growth in sales may influence its performance.

The Size of the firm – we measure the size of the firm (Size) as the natural logarithm of total assets.

Growth –it is the rate of growth in sales for the previous year.

**3.3 Specification of the Model**

The following multiple regression model has been used to test the theoretical relation between the dependent variables and other independent variables of the firm of Indian cement companies:

$$Y_{it} = \beta_0 + \sum a_i X_{it} + \sum b_i Z_{it} + U_t$$

Where  $Y_{it}$  = Dependent Variable of firm i at time t;  $i=1,2,\dots,18$  firms

$\beta_0$  = The intercept of equation

$a_i$  = Coefficients of  $X_{it}$  Variables

$b_i$  = Coefficients of  $Z_{it}$  Variables

$X_{it}$  = The different independent variables of the firm i at time t

$Z_{it}$  = The different independent variables serving as control variables of firm i at time t

t = time: 1, 2... 8 years

$U_t$  = Error term

The general form of the model is developed following the (Aregbeyen, 2013).

**IV. Analysis And Results**

**4.1. Descriptive Statistics**

Table 1 presents a summary of descriptive statistics of the dependent and independent variables used in the study. The mean ROA and EPS are 0.42 and 15.90 respectively. These outcomes recommend that Indian cement firms have relatively poor performance during the study period (2007 – 14). This is may be because most of the cement firms in India have shown less returns or profitability of the firms during the period is less. The mean of the Tobin's Q is 0.39 which is less than one suggesting that the market value of listed companies is less than their book value. On the other hand, the mean of leverage is 41 percent, it implies that about 41 percent of the total assets of cement firms are financed by debt. Which show that most of the cement companies are moderately levered. The mean of debt-equity is 1.04, this implies that most of the firms in the cement industry are financed through debt.

**Table 1: Descriptive statistics**

	TQ	ROA	EPS	DE	LIABILITIES	LEVERAGE	SIZE	GROWTH
Mean	0.397	0.426	15.904	1.042	200.668	0.410	2.647	19.847
Median	0.220	0.256	6.390	0.855	95.890	0.428	2.680	13.540
Maximum	3.548	2.740	336.240	4.990	1181.120	0.845	3.863	338.400
Minimum	-0.078	-0.043	0.000	0.000	1.300	0.000	0.990	-46.910
Std. Dev.	0.504	0.518	36.341	0.979	279.793	0.204	0.689	38.247
Skewness	2.592	2.005	6.754	2.238	2.047	-0.180	-0.052	4.253
Kurtosis	13.426	7.942	54.981	8.734	6.717	2.717	1.982	34.955
Observations	144	144	144	144	144	144	144	144

**4.2. Correlation Analysis**

Correlation analysis was carried out to find out the relationship between determinants of capital structure and the measures of the firm's performance. Table 2 shows the debt-equity ratio is negatively correlated with Profitability (ROA), market value (Tobin's Q) and Shareholder value (EPS). This implies, as the

debt-equity ratio increases market value of the firm increments up to a point and declines value beyond that point. Profitability of the firm and EPS are positively correlated that means as the profitability increases the shareholder value will increase with better returns as the price of the stock goes up. Profitability (ROA) is negatively correlated with the liabilities of the firm. This shows as the liabilities of the firm increase its profitability decreases. There is a negative association between leverage and profitability and Tobin's Q. The results indicate the less the leverage level the more the profitable the firms are, and market value increases. The size of the firm is positively correlated with Tobin's Q and EPS. Whereas ROA is negatively correlated. That means the utilization of the assets is less as the size of assets increases and leading to less profitability. Rate of growth of sales positively correlated with the all the dependent variables. That means as the growth of sales increases Profitability increases and this intern increases the shareholder value and market value of the firm.

**Table 2: Correlation matrix**

	TQ	ROA	EPS	DE	LIABILITIES	LEVERAGE	SIZE	GROWTH
TQ	1							
ROA	-0.326	1						
EPS	0.000	0.451	1					
DE	-0.276	-0.065	-0.021	1				
LIABILITIES	0.137	-0.005	0.089	-0.034	1			
LEVERAGE	-0.326	-0.046	0.057	0.840	0.126	1		
SIZE	0.145	-0.009	0.185	-0.017	0.764	0.225	1	
GROWTH	0.154	0.141	0.089	0.092	0.020	0.100	-0.005	1

Source: Computation of Authors

**4.3. Multi-Collinearity**

Before running the regression analysis, examination concerning the multi-collinearity problem was completed. It is seen from the correlation matrix (Table 2) that the leverage and Debt-equity ratio are having the correlation of 0.84. This shows an Indication of multi-collinearity problem between leverage and debt-equity ratio. Multi-collinearity problem causes an increase in the standard error of the coefficients. To find is there any multi-collinearity problem between these variables, we used variance inflation factor (VIF). It can be seen from Table 3 that the VIF of Leverage is 4.27, while that of debt-equity ratio is 4.02. Hence, as the VIF of leverage becomes the highest, this particular variable is dropped from the study while doing the next phase of analysis. When we remove the leverage and again test the multi-collinearity problem by the VIF, we observe from Table 4 that VIF remaining independent variables are below 4 and, hence the multi-collinearity problem does not exist among the independent variables.

**Table 3: Collinearity diagnostics**

Model		Collinearity Statistics
1,2,3	Debt - equity ratio	VIF 4.02
	Liabilities	2.43
	Leverage	4.27
	Size	2.77
	Growth	1.01
	Mean VIF	2.90

Source: Computation of Authors

Note:

In Model 1 Dependent variable: return on assets (ROA)

In Model 2 Dependent variable: Tobin's Q

In Model 3 Dependent variable: EPS

**Table 4: VIF table after removing the leverage (with highest vif factor)**

Model		Collinearity Statistics
1,2,3	Debt - equity ratio	VIF 1.01
	Liabilities	2.40
	Size	2.40
	Growth	1.01
	Mean VIF	1.71

Source: Computation of Authors

Note:

In Model 1 Dependent variable: return on assets (ROA)

In Model 2 Dependent variable: Tobin's Q

In Model 3 Dependent variable: EPS

**4.3 Regression Analysis**

To reveal more insight into the impact of capital structure on profitability, the market value of the firm and shareholder wealth multiple regression analysis applied on the panel data. After removing the independent variable leverage from the sample. In panel data analysis we have used the fixed effect model and random effects model over pooled ordinary least square (OLS) model due to the limitations of the OLS model i.e. Failure to control over the time invariant firm specific heterogeneity. To choose the best model to convey further examination among the two models, we have done the Hausman test. The Hausman test statistics were indicated fixed effect model is appropriate for the regression analysis. Using the following fixed effect models, this study will examine the influence of capital structure on profitability, the market value of the firm and shareholder value.

$$ROA_{it} = \beta_0 + \beta_1 DE_{it} + \beta_2 liabilities_{it} + \beta_3 size_{it} + \beta_4 Growth_{it} + \mu_{it} \text{ ----- (1)}$$

$$TQ_{it} = \beta_0 + \beta_1 DE_{it} + \beta_2 liabilities_{it} + \beta_3 size_{it} + \beta_4 Growth_{it} + \mu_{it} \text{ ----- (2)}$$

$$EPS_{it} = \beta_0 + \beta_1 DE_{it} + \beta_2 liabilities_{it} + \beta_3 size_{it} + \beta_4 Growth_{it} + \mu_{it} \text{ ----- (3)}$$

Table 5 shows the results of Model 1 which examined the relationship between ROA and Debt-equity ratio. The results confirm that ROA has positive relations with debt-equity ratio (0.02) and it is not significant. Whereas liabilities has a significant positive relation with ROA. The size of the firm has significantly negative relation with ROA. Finally, growth has insignificant positive relation with the profitability of the firm. It would be observed from the R<sup>2</sup> value (0.80) that about 80 % of systematic variation in ROA is explained by the independent variables. Durbin Watson statistics (1.70) reveal that there is no auto-correlation in the model.

**Table 5: Model 1 - Regression result**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.524112	0.358603	9.827331	0.0000
DE	0.028989	0.045948	0.630907	0.5293
LIABILITIES	0.000478	0.000200	2.388434	0.0185
SIZE	-1.225541	0.148900	-8.230626	0.0000
GROWTH	0.001041	0.000577	1.803556	0.0738
R-squared	0.801337	Mean dependent var		0.426412
Adjusted R-squared	0.767141	S.D. dependent var		0.517768
F-statistic	23.43361	Durbin-Watson stat		1.705999
Prob(F-statistic)	0.000000			

Source: Computed by Author

Note: Dependent Variable: Return on Assets (ROA)

Table 6 shows the results of model 2 which investigate the influence of capital structure on the Tobin's Q. The result shows insignificant positive relation between Tobin's Q and debt-equity ratio. The size and liabilities are having the significant negative relation with the Tobin's Q. Whereas growth has insignificant positive relation. Durbin Watson statistics show, there is no autocorrelation in the model. The R<sup>2</sup> value (0.80) indicates that about 80% of the deviation in the Tobin's Q is explained by the independent variables.

**Table 6 Model 2 - regression result**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.963489	0.347677	5.647444	0.0000
DE	0.032069	0.044548	0.719878	0.4730
LIABILITIES	-0.000389	0.000194	-2.006293	0.0470
SIZE	-0.579148	0.144364	-4.011731	0.0001
GROWTH	0.000581	0.000560	1.038212	0.3012
R-squared	0.802706	Mean dependent var		0.397136
Adjusted R-squared	0.768746	S.D. dependent var		0.503732
F-statistic	23.63651	Durbin-Watson stat		1.675168
Prob(F-statistic)	0.000000			

Source: Computed by Author

Note: Dependent Variable: Tobin's Q

Table 7 shows the results of model 3 which shows the positive relation between the debt-equity ratio and the Shareholder value i.e. EPS. But the value is insignificant. Liabilities of the firm have significant positive relation with EPS. Size has significant negative relation with the EPS. And Growth has insignificant positive

relation with the EPS. Low value of  $R^2$  value (0.38) is observed. This indicates 38 % of the shareholder return for their investment is explained by the independent variables.

**Table 7 Model 3 - Regression result**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	204.0727	44.26251	4.610510	0.0000
DE	7.460440	5.671420	1.315445	0.1908
LIABILITIES	0.050368	0.024693	2.039765	0.0435
SIZE	-78.39676	18.37879	-4.265610	0.0000
GROWTH	0.075322	0.071242	1.057271	0.2925
R-squared	0.385629	Mean dependent var		15.90417
Adjusted R-squared	0.279877	S.D. dependent var		36.34128
F-statistic	3.646528	Durbin-Watson stat		1.343363
Prob(F-statistic)	0.000003			

Source: Computed by Author

Note: Dependent Variable: EPS

## V. Conclusion

Based on the study on firms in the Indian cement Industry using the accounting based measure of firm performance (ROA) is positively correlated with all the independent variables (Debt-equity ratio, liabilities, size, growth). The shareholder wealth calculated by EPS is positively correlated with debt-equity ratio, but it is not significant and liabilities has significant positive correlation with EPS. On the other hand Tobin's Q and EPS have a positive relation between debt-equity ratio. These findings contradicting the previous studies such as (Fama & French, 2002) found negative relationship between debt and firms performance. Empirical studies carried by (Hadlock & James, 2002) and (Berger & Bonaccorsi di Patti, 2006) supporting this positive relationship. The average value of the debt-equity value (1.04) shows that most of the firms in the cement industry are financed through debt. It is also observed that the control variable firm size has significant negative relation to the all the independent variables. This implies the size of the firms in cement industry increase profitability decreases and then market value decreases, intern this leads to decrease in EPS. This is true when the firm asset utilization level is less. The sales growth rate has positive association with the three dependent variables. This study finds no statistically significant relationship between capital structure and the profitability, market value and shareholder wealth. These results lead the study to conclude that capital structure choice, in general terms, has less influence on profitability, market value and shareholder wealth of listed cement manufacturing firms in India.

However, issues relating to capital structure still remain as question marks. Further research could examine the determinants of capital structure of Indian cement firms by incorporating more variables and larger sample in the regression models to get better results.

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