

# Impact of Financial Leverage on Value of Firms: Evidence from Cement Sector of Pakistan

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## Abstract

The purpose of this paper is to investigate the effect of financial leverage on firm's value in cement sector of Pakistan. By selecting the appropriate panel econometric technique between fixed effects and random effects, the association between financial leverage and firm's value of all cement companies listed on the Karachi Stock Exchange during 2008-2012 has been analyzed. The total number of listed cement companies at KSE is 19. The empirical results depict that financial leverage has positive and statistically significant association with value of firm which is represented by Tobin's Q. It is apparent from these findings that cement companies of Pakistan can increase their value by creating a suitable mix of equity and debt in their capital structure. Among the control variables, firm size is negatively and insignificantly related with Tobin's Q. Asset tangibility has inverse and significant relationship with Tobin's Q. The liquidity is found to have positive and significant association with value of the cement companies which show that efficient working capital management leads to increased firm value. The conclusions of this study have practical implications for financial managers of cement sector to include a suitable amount of debt in their capital structure.

**Keywords:** Pakistan, Financial leverage, Firm's value, Cement sector

## Introduction

Since Modigliani and Miller (1958) presented irrelevance proposition under restrictive assumptions that capital structure does not affect firm value, an intensive investigation has been made on the topic of capital structure (the mix of debt and equity capital). A number of studies have proved that financial leverage significantly affects value of firm. The researchers have found no clear dimension of association between leverage and firm's value as there are mixed findings. Some studies have found positive association between leverage and firm value while others found inverse association between the two. According to Jermias (2008), the use of debt financing not only provides a tax shield to the firm but it also ensures increase in efficiency because of restrictive covenants imposed by the lenders. On the other hand, Phillips and Sipahioglu (2004) and Qureshi (2007) found inverse association between level of debt and firm value.

The objective of this paper is to investigate the nature of association between financial leverage and value of cement firms of Pakistan. For that purpose the total population of cement companies listed at Karachi Stock Exchange has been taken. The number of total listed companies at KSE is 19. The value of firm has been taken as dependent variable and is represented by a market-based measure, Tobin's Q. Financial leverage has been used as independent variable and is calculated by taking a ratio of debt to equity. The paper included firm size, asset tangibility and liquidity as control variables. The previous literature suggest that the firm's value can best be represented by Tobin's Q because it explains a number of corporate dimensions like Tobin's Q describes the differences in decisions about diversification and investment among firms, the association of equity ownership of corporate managers with firm's value and payout, funding and compensation policies (Chung & Pruitt, 1994; Wolfe & Sauer, 2014). Tobin's Q is also considered as to how the investors value a firm.

## Review of Literature

McConnell and Servaes (1995) examined the association between leverage and firm value in a large sample of non-financial U S firms. The findings showed that for high growth firms the association between corporate value and leverage is inverse. Barakat (2014) also studied the effect of financial arrangement, leverage and profitability on manufacturing companies of Saudi Arabia. He found a positive association between independent variables, return on equity and capital structure, and the dependent variable, stock market price. There was a weak and inverse relationship between financial leverage and stock value which showed that changes in level of financial leverage did not affect company's value. A positive association was observed between capital structure and ROE and a significant association between capital structure and stock value was found.

Aggarwal and Zhao (2007) presented evidence on how the growth of firm might affect the association amid capital structure and performance. Firms with high level of growth had inverse association between financial leverage and firm value, while firms with low growth level had positive relation with financial leverage.

Soumadi and Hayajneh (2012) investigated the association between capital structure and performance

of the public Jordanian companies listed at the Amman Stock Exchange. The results concluded that capital structure inversely associated with firm performance. No significant difference was observed for the impact of the financial leverage on performance of high levered firms and low levered firms. There was also no difference between financial leverage of high growth firms and low growth firms on the performance which is represented by profitability in terms of ROE and firm's value in terms of Tobin's Q.

Fosu (2013) examined the relationship between capital structure, product market competition and firm performance in South Africa. He examined the effect of capital structure on firm performance and investigates the extent to which the relationship depends on the level of product market competition. Results showed that financial leverage has a positive and significant relationship with firm performance. It is also found that product market competition enhances the performance effect of leverage. Performance was measured by return on assets and Tobin's.

Khan (2012) examined the association between capital structure decision and firm performance in KSE listed engineering firms of Pakistan. The results show that financial leverage had a significantly inverse association with firm performance that is represented by Return on Assets, Gross Profit Margin and Tobin's Q. The association between financial leverage and firm performance represented by return on equity was inverse and insignificant. Asset size has an insignificant relationship with the firm performance measured by ROA and GM but negative and significant relationship existed with Tobin's Q.

Raza (2013) studied the effect of financial leverage on financial performance on listed companies in KSE. He found an inverse association between performance and leverage because long-term debt is more costly due to certain direct and indirect costs. Financial performance is represented by return on assets, return on equity and Tobin's Q.

Aivazian, Ge, and Qiu (2005) analyzed the relationship between financial leverage and investment of firm in Canadian firms. The results of their study showed a negative relationship between leverage and investment. This effect became stronger in firms with low growth than firms with high growth. The firm growth was measured by Tobin's Q. According to Cheng and Tzeng (2011), the firms with higher levels of leverage had higher values than the firms with lower levels of leverage. This effect depended on the quality of firm finances. Hurme (2010) analyzed the data of US firms and found that the firms with low q had inverse relation between their leverage and future growth. The firms with high q also experienced negative association between leverage and growth specifically during the post-recession intermediary periods. In China, there has been found a negative impact of leverage on investments of firms even in state-owned companies which are backed by government. This negative impact became stronger in non-state-owned firms. Firms with high leverage had negative impact of marginal q on investment (Bao, 2010).

### **Hypotheses**

On the basis of the previous literature, following hypotheses have been developed.

- Hypothesis 1: Financial leverage has a significant relationship with firm value.
- Hypothesis 2: Firm size has a significant relationship with firm value.
- Hypothesis 3: Assets tangibility has a significant relationship with firm value.
- Hypothesis 4: Liquidity has a significant relationship with firm value.

### **Data, variables and research methodology**

#### **Data**

The objective of this paper is to investigate the association between financial leverage and value of firm in cement sector of Pakistan during 2008-2012. The five year panel data were taken from annual financial reports of the companies. The Balance Sheet Analysis of non-financial companies listed at Karachi Stock Exchange published by the State Bank of Pakistan has also been used as a guideline to measure the value of firms. For the purpose of this study, 19 cement companies have been taken which is the total population of the KSE listed cement companies of Pakistan. The data about the market price of stocks has been taken from the annual record of KSE.

#### **Variables**

The variables used in this paper have been taken largely from the previous literature to draw a meaningful comparison with prior researches. The value of firm is taken as dependent variable and is measured by Tobin's Q which is considered as an accounting-based measure of firm value. Financial leverage has been used as an independent variable while the study is controlled for firm size, asset tangibility and liquidity. The definitions of all variables are given in table I.

*Variable Description*

Variables	Definition
<i>Dependent variable</i>	
Tobin's Q	Ratio of total market value of firm to total assets
<i>Independent variable</i>	
Financial leverage	Ratio of debt to equity
<i>Control variables</i>	
Firm size	Annual net sales of firms in rupees
Asset tangibility	Ratio of fixed assets to total assets
Liquidity	Ratio of current assets to current liabilities

**Research Methodology**

The study has used panel data techniques because the population contains data which is cross-sectional and over time. Two techniques of panel econometrics have been used including fixed effects and random effects regression models. The fixed effects regression model allows variation in the intercept of each firm keeping the slope parameters constant for all firms and periods while the random effects model assumes random and uncorrelated variation across firms with the independent variables included in the model. To choose the appropriate estimation model between fixed effects and random effects models, the study has used Hausman specification test. The following regression model has been used in this study.

$$TQ_{it} = \beta_0 + \beta_1 (LEV)_{it} + \beta_2 (SZ)_{it} + \beta_3 (TANG)_{it} + \beta_4 (LIQ)_{it} + \varepsilon_{it} \dots\dots\dots (1)$$

Where

- i = is the *i*th cross sectional unit
- t = is the *t*th time period
- TQ<sub>it</sub> = stands for Tobin's Q
- LEV = refers to financial leverage
- SZ = refers to firm size
- TANG = stands for tangibility
- LIQ = refers to liquidity
- β<sub>0</sub> = is the intercept
- ε<sub>it</sub> = is the error term

**Results**

**Descriptive Statistics and Correlation of Variables**

Table 2 shows the results of descriptive statistics. The mean Tobin's Q is 291.86 indicating the average firm value with a standard deviation of 441.621. The average value of Tobin's Q indicates that the cement companies are worth more than the cost of their assets which shows that the companies are overvalued or more precisely the investors have more confidence on the cement companies of Pakistan. The mean value of financial leverage in cement sector is 0.0174 which is very low and indicates that on average, cement companies are using less amount of leverage. These findings confirm the results of Demirgüç-Kunt and Maksimovic (1999) that the firms of developing countries use less amounts of long-term debt in their capital structure.

**Table 2: Descriptive Statistics**

Variables	Observations	Mean	SD	Minimum	Maximum
TQ	95	291.860339	441.6210644	0.4580	3363.0092
LEV	95	0.017406	21.4387571	-204.0736	22.3689
SZ	95	1449613096	3613336959	0.0000	17788955131
TANG	95	0.753840	0.01332576	0.3888	0.9430
LIQ	95	0.790741	0.5462969	0.1694	2.6363

Table 3 presents the results of Pearson's correlation among all variables. The results show that there is a weak association between financial leverage and Tobin's Q with a correlation value of 0.026. Firm size (SZ) has an inverse association with Tobin's Q with a value of -0.266. Asset tangibility also has a negative relation with TQ having a correlation value of -0.375 while liquidity is positively and significantly associated with TQ with a value of 0.408. The correlation matrix has been constituted by using raw data before removing heteroskedasticity.

**Table 3: Correlation Matrix**

Variables	TO	LEV	SZ	TANG	LIQ
TQ	1				
LEV	0.026	1			
SZ	-0.266**	0.032	1		
TANG	-0.375**	-0.096	-0.177	1	
LIQ	0.408**	0.078	-0.144	-0.583**	1

\*\*correlation is significant at the 1% level (two-tailed).

### Regression Results

The data has been screened for multicollinearity, heteroskedasticity and autocorrelation. There has been found no multicollinearity and autocorrelation. The heteroskedasticity has been found in the data and removed by the robust command.

The regression analysis has been performed on the data. To choose between the two available estimation options, fixed effects and random effects, in regression analysis, the Hausman specification test has been applied. The results rejected the null hypothesis that random effects regression model is suitable. Hence, fixed effects regression model has been used for data analysis.

During the process of data analysis, the equation (I) has been estimated and the results are presented in Table 4. According to the results, leverage is positively and highly associated with value of the firm which is measured by Tobin's Q. The t-value is 4.54 and p-value is 0.000. These results confirm the findings of Fosu (2013). It is clear from these findings that an increase in the level of financial leverage increases the value of firm. The use of fixed cost financing magnifies the rate of company's return which attracts the investors to invest in that company. Increased interest of investors in a company also increases its value which is calculated in terms of Tobin's Q in the current study. Firm size is inversely and insignificantly related with value of firms having 1.68 as t-value and 0.110 as p-value. These findings are in consistency with the results of Durand and Coeurderoy (2001), and Tzelepis and Skuras (2004). These researchers also found negative and insignificant relation between size and firm value. In the same way, asset tangibility is negatively but significantly related with Tobin's Q with 2.05 and 0.055 as t-value and p-value respectively. Alternatively, the third control variable liquidity is found to be positively and significantly related with firm value. Liquidity has a t-value of 2.30 and p-value of 0.034. It is one of the basic fundamentals of financial management to manage the working capital of a business firm. Working capital management consists of management of current assets and current liabilities. It is evident from the data that cement companies of Pakistan are using heavy amounts of short-term financing and they are maintaining low amounts of current assets which increases the profitability of the firm and increased profitability resultantly increases the firm's value.

**Table 4 Fixed Effects Regression Results**

Variables	Coefficients	Standard Error	t-value	p-value
LEV	0.6856362	0.1509678	4.54	0.000
SZ	8.83 e - 09	5.25 e - 09	1.68	0.110
TANG	1170.55	569.8266	2.05	0.055
LIQ	166.7013	72.61742	2.30	0.034
Total observations:	95			
R-square:	0.0598			
F-value:	0.0000			
Durbin-Watson:	1.587			

### Conclusion

This paper examines the nature of association between financial leverage and firm's value. Value is measured by Tobin's Q. A population of 19 KSE listed cement companies has been taken for a period of five years from 2008-2012. Panel data has been used for the purpose of analysis which is consisted of 95 observations. On the basis of the results of Hausman specification test, fixed effects regression model has been used to analyze the data. The empirical results show that financial leverage has positive and statistically significant relation with firm's value. Value of firm has negative association with two control variables, firm size and asset tangibility. This association is insignificant with firm size while significant with asset tangibility. The relationship of firm's value with the third control variable liquidity is positive and statistically significant.

The financial data of the cement companies indicate that they are using low amounts of leverage and their amount of debts contain larger proportions of short-term debts. The heavy reliance on short-term financing is due to the fact that the capital market of Pakistan is under-developed which make it difficult for the firms to raise the loan by using corporate bonds. Moreover, the firms are also free from the constraints that are imposed by the lenders in case of long-term debts.

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