Research Journal of Finance and Accounting
ISSN 2222-1697 (Paper) ISSN 2222-2847 (Online)
Vol.9, No.13, 2018


# An Investigation of Financial Leverage by Financial Performance

Kamran Mohy-ud-din Hamad-ul-Haq
Department of Management Sciences
IQRA University Karachi

**Abstract**
The aim of the study is to find and explain the nature of relationship between financial leverage and financial performance of cement industry. Degree of financial leverage is explained by overall profitability, earnings per share, return on equity and return on assets of cement industry of Pakistan. The influence of financial performance on financial leverage is investigated by Fixed and random effect approach. Random effect approach is preferred over the fixed effect approach to determine the degree of financial leverage explained by Hausmen test. Moreover the diagnostic tests are used to check the preference between two models and their perfection of the model. Empirical results are explaining that the returns on assets and earnings per share have significant impact on the financial leverage of cement industry. There is positive correlation between them. This study provide the first attempt in investigating the impact of financial performance on financial leverage in the context of Pakistan cement industry. This study highlights the different ways in which the financial leverage of cement industry is impacted by financial performance. Research method that is employed provides an applicable framework for investigating the relationship between economic variables.
**Keywords:** Degree of financial leverage, Net Profit Margin (NMP), Return on Equity(ROE), Return on Assets(ROA), Earnings per Share(EPS)' Paper type Research paper

## 1. Introduction

The ratio of debt and equity has been extensively studied in capital structure decision making of the business. In corporate finance theory two Modigliani and Miller (1958) explained new aspects in capital structure. They explained that if the firm takes debt or not, the value of a firm is not influenced by the leverage. Capital structure explained by the Modigliani and Miller was based on the unrealistic assumptions. These assumptions have no applications in the realistic world. They proposed that there is no transaction and bankruptcy cost. Moreover firms are free from the taxes and the information about market situations is equally available to investors. Modigliani and Miller (1963) explore that the taxes have significant impact on the capital structure of the firm. So the firms can gain maximum tax shields by increasing their debt ratio in their capital structure. They proposed that with zero taxes the value of remains same, meaning that levered and unlevered firms have equal value. Moreover, in tradeoff theory value of levered and unlevered firms are equal but it add the value possible side effect such as tax shield and any expected financial loss. So, the firms can take the advantages of debt to get better returns based on its capital structure decision making.

Both professors claimed that the firms should utilize the maximum debt in their capital structure due to the favorable conditions of interest payments. But the theory does not consider the direct effect of the debt on the financial performance and relationship between them. Furthermore, the financial leverage creates the problems for the firms in a way that they are operating in developed or developing countries. This thing creates the issue in decision making of firms about their capital structure. So, it is important to understand the influence of borrowed capital on the financial performance.

### 1.1 Background of the Study

The cement Industry in Pakistan is supposed as the largest industry after the textile Industry. Pakistan has recognized as agriculture based country which has a strong base of cement industry that is installed with high capacity of yearly production of cement. But this industry is not in the position to retain in the global level industry due to high cost of production. Since the last past ten year Pakistan industry is facing due to the energy deficiency and labor orientation is still facing financial crises. These crises are affected on the factors of production such as the employees, owners alike and raw material suppliers, in the meantime the crucial effect of these factors of production leads to ultimate financial performance of the cement Industry.

In addition, this also creates a trouble with the capital structure of firm because many times the firms were unable to retain the leverage and their financial performance may hurt. And in this respect the management's decision play a crucial role in determining the value for its shareholders as well firms profit margin while defining the capital structure. For this reason, the theoretical framework has been established to test the assumptions on this very important industry of Pakistan that has potential to stature the economy of a country if the decisions made rightly.

 

### 1.2 Problem Statement

Financial leverage changes affect the firm's profitability and increases the greater risk for its shareholders earnings and investor became cautious to invest in such firm. As cement Industry of Pakistan already facing issues related to factors of production i.e. raw materials supplies, delay in payment of employees and volatility of shareholders equity has an ultimate impact on financial performance of Industry. In such situation, Capital structure determines the value for its shareholders and profit for the firm. Whereas financial leverage has an important role either to gain tax shields or value for its shareholders. So it is very important to understand that what extent financial leverage has effect the financial performance of firm.

## 2. Literature Review

A positive and significant relationship exists between financial leverage and financial performance ( Moghadam & Jafari, 2015). But in case of insurance companies leverage has a significant and negative impact on the financial performance ( Foong & Idris, 2012). In restaurants industry leverage has positive relationship with profitability (Yoon & Jang, 2005). Financial leverage has a positive relationship with returns on asset ( Fasih Ur Rehman, 2013). Moreover, return on equity of shareholder's return is positively influenced by financial leverage (Mehta, 2014). Ahmad et. al. (2015) the hypothesized in their results that there is a significant relationship found between the financial leverage and profitability of firms. Based on the empirical evidence it is found that highly leverage firms have lower profitability but the firms having lower leverage found higher profitability. International diversification has a significant and indirect impact on the profitability of hotel industry by moderating influence of leverage. Furthermore, stock returns are positively correlated with leverage (Muradoglu & Sivaprasad, 2013).

There is a theoretical provision for a positive relation of returns on equity with leverage (Modigliani and Miller, 1958). Size of a firm and leverage are having positive and significant impact on the Return on assets, return on equity and the earnings per share. Moreover, it indicates the leverage has a significant association with financial performance (Bashir, Fatima, Sohail, Rasul, & Mehboob, 2018). Relative size of the firm and financial leverage has a significant effect on returns on equity ( Angell & Brewer, 2003). Gross Profit Margin (GPM) has a positive effect on the value of firm. Gross Profit margin return on assets and return on equity has significant influence on leverage and firm value has a positive influence of the leverage of firm value ( Priswanti, Andini, & Marsiska , 2017).

Leverage is positively associated with the return on equity, earnings per share, Net Profit Ratio and ROCE but the extent of correlation is not very high. There is week of leverage with EIBT that is 0.15 and minimum is 0.004 with ROE. Average correlation of debt to equity with profitability ratio is all about near to zero but it is more than zero. So it can be explaining as week and positive correlation phenomenon (Abhishek & Hussain, 2017). Financial leverage of the MNCs on the average is below than 1.00 as MAD/Mean of EBIT is higher than that of earnings per share. Financial leverage (MAD) was increased during in the periods of 2002 to 2007. Average financial leverage (MAD) of MNCs is 0.607. Financial leverage ranges from 0.352 to 1.172 ( Rahman, Ashraful, & Mohiuddin, 2018). Market capitalization and shareholder's return is not influenced by the financial leverage. There might be other qualitative factors such as recession, competition, government policy and saturation of the auto industry can nullify the influence of leverage on the returns of shareholders. Financial leverage leads to a speculative technique because of risk and cost involvement ( Pachori & Totala, 2012). Earnings per Share (EPS) mostly depend upon on leverage shock and feedback shock. Leverage shocks are indirectly affected by the earnings Per Share through Net Assets per Share of the firm. As Net Assets per Share of the firm is change due to the earnings Per Share. In this way the corporate performance is affected by the financial leverage ( Ojo, 2012).

In the restaurant industry the highly levered firms have low profitability. Due to highly leverage in restaurant industry high risk involved in the return on investment and return on equity. Market profits change the stock prices as a result the stock prices are changed due to the returns on equity (Eunju & SooCheong, 2005). High risk involved due to the leverage which leads to the high level of volatility in the sock prices. This volatility is due to the change in the debt to equity ratios in different industries. Mostly underpricing of stocks directly creates losses on the corporate sectors. It can increase the stock prices in short term but in long term it creates the systematic risk. This leads to the decrease in the stock prices (Bhatti, Majeed, Ijaz-ur-Rehman, & Khan, 2010).

Profitability and leverage has significant relationship. Association of Degree of leverage, degree of financial leverage and degree of total leverage with return on investment is also significant. Profitability is preferably measured by the return on investment. In return on investment operating decisions as well as financing decisions are considered. Profit after taxes becomes low due to high financial costs and operating costs in most of the time periods. Due to different issues related to different industries, %age change in earnings per share stimulated positively with return on investment that result in positive relationship with Degree of Total Leverage (Jahan & Mostofa, 2017).

 

## 3. Data and methodology

The panel data have been collected of the top nine cement producing companies listed on KSE. The data extracted from annual financial statements and reports of cement companies. The cement company's data have been collected for the extensive period 2012 to 2017. The total 45 observations have been taken to conduct this study after total panel observations adjusted. In addition, some companies have been excluded on the basis of non-availability of data in order to ensure sufficiency of data. Total five variables have been used in this study, one dependent variable and four dependent variables. Table 2 gives description of all the variables used in this study:

$$DFL_{it} = \alpha + \beta_1 NPM_{it} + \beta_2 ROA_{it} + \beta_3 ROE_{it} + \beta_4 EpS_{it} + \epsilon_{it}$$

Here 'DFL=Degree of financial leverage, NPM=Net Profit Margin, ROE=Return on Equity, ROA=Return on Assets, EPS= Earnings per Share'

### 3.1 Variables Description

| Variables | Measurement |
|---|---|
| **Dependent Variable** | Financial Leverage ( Fasih Ur Rehman, 2013). |
| DFL | DFL =EBIT/(EBIT-Interest) |
| **Independent Variables** | Financial Performance |
| Net Profit Margin (NPM) | It is measured as the %age of revenue left over after all operating expenses, interest, taxes and preferred stock dividends (but not common stock dividends) have been deducted from a company's total revenue |
| Return on Assets (ROA) | Company's annual earnings divided by its total assets |
| Return on Equity (ROE) | Measures a corporation's profitability by revealing how much profit a company generates with the money shareholders have invested. |
| Earnings Per Share (EPS) | Portion of a company's profit allocated to each outstanding share of common stock |

## 4. Results and Findings

Results and empirical analysis are consists of mainly four parts.
(1) Explanation of data estimators by descriptive statistics test.
(2) Construction of unit root in the variables by Augmented Dickey-Fuller test.
(3) We precede the pooled and random effect model.
(4) Diagnostic tests are being explained the validity of model.

### 4.1 Descriptive Statistics

**Table 1**: Descriptive Statistics

| | DFL | NPM | ROA | ROE | EPS |
|---|---|---|---|---|---|
| Mean | 0.589325 | 20.08222 | 19.78978 | 18.99289 | 17.33289 |
| Maximum | 8.742938 | 43.96000 | 100.0000 | 40.87000 | 131.9400 |
| Minimum | -7.42197 | 0.000000 | 0.000000 | 0.000000 | 0.000000 |
| Std. Dev. | 2.224480 | 8.555291 | 22.11161 | 10.07900 | 20.60684 |
| Skewness | 0.067888 | -0.23213 | 2.690217 | -0.2162 | 3.955169 |
| Kurtosis | 8.765183 | 3.625077 | 9.726264 | 2.559151 | 22.45722 |
| Jarque-Bera | 60.96891 | 1.136716 | 139.1094 | 0.714960 | 827.1691 |
| Probability | 0.000000 | 0.566455 | 0.000000 | 0.699437 | 0.000000 |
| Sum | 25.93029 | 903.7000 | 890.5400 | 854.6800 | 779.9800 |
| Sum Sq. Dev. | 212.7775 | 3220.492 | 21512.63 | 4469.796 | 18684.25 |

Average values of all variable are about equal except DFL. It is because the DFL have mostly negative observations. Skewness of NPM and ROE is less than −1 so the distribution of data is highly skewed. This one indicating the data is negatively skewed or skewed left. So, the left tail of distribution is longer. Skewness of DFL is between −½ and +½ so, the distribution is approximately symmetric. Skewness of ROA and EPS greater than +1 which is showing that distribution is highly skewed**.** Jarque-Bera is a tst that explain the goodness of fit test of whether sample data has the required Skewness and kurtosis which matched with normal distribution. Data of DFL, ROA and EPS is normally distributed. As the p- value of the Jarque-Bera statistic is less than .05. The kurtosis of DFL, ROA and EPS is higher than 3, indicates a leptokurtic distribution with high peakedness than a normal distribution with longer tails meaning that dataset has heavier tails than a normal distribution (more in the tails). The kurtosis of NPM is Mesokurtic indicating a bell-shaped normal distribution. But the kurtosis of ROE is less than three which shows a Platykurtic distribution meaning that curve is flatter than a normal distribution with shorter tails. (See table 1. Descriptive Statistics)

 

### 4.2 Unit root test

**Table 2**: Pooled Unit root results

| | | Level | | First differences | |
|---|---|---|---|---|---|
| Variables | Pool unit root tests | Statistic | Probability | Statistic | Probability |
| **DFL** | ADF Fisher | 47.9344 | 0.0002 | ------ | ------ |
| **NPM** | ADF Fisher | 27.0890 | 0.0773 | 44.0483 | 0.0006 |
| **ROE** | ADF Fisher | 14.1723 | 0.5859 | 23.8974 | 0.0918 |
| **ROA** | ADF Fisher | 17.7614 | 0.3381 | 31.0421 | 0.0133 |
| **EPS** | ADF Fisher | 20.3705 | 0.3124 | 44.3742 | 0.0005 |

For a financial time series data it is necessary to check the stationarity of every variable before model estimating. At the first look it is showing that the data of NPM, ROE, ROA and EPS is none-stationary at level but after getting first difference it becomes stationary. But DFL is already stationary at level (See Table 2. Unit root test results).

### 4.3 Pooled and Random Effect Model

Over all models are significant as p-value of f-statistic is less than .05. About Thirty percent of the Degree of financial leverage is explained by the independent variables in pooled regression. But Thirty five percent of the Degree of financial leverage is explained by the independent variables in random effect model. Only Return on Equity and Earnings per Share is significantly explaining the Degree of financial leverage in both models. But random effect is preferred over the pooled regression by Hausment test (See table IV). One unit increase in the Return on Equity leads to 2.56 units increase in the Degree of financial leverage. Similarly, one unit increase in the Earnings per Share leads to 4.42 units increase in the Degree of financial leverage. But Net Profit Margin and Return on Assets are insignificant in the model (see table 3 Pooled & Random effect model).

**Table 3:** Pooled & Random effect model

| **Dependent Variable:** DFL | **Pooled Regression** | | | **Random Effect Model** | | |
|---|---|---|---|---|---|---|
| **Variable** | **Coefficient** | **t-Statistic** | **Prob.** | **Coefficient** | **t-Statistic** | **Prob.** |
| C | -0.720493 | -0.693915 | 0.4918 | -0.515442 | -0.469263 | 0.6415 |
| NPM | 0.055712 | 1.103849 | 0.2764 | 0.033242 | 0.629845 | 0.5325 |
| ROA | 0.014245 | 0.825413 | 0.4142 | 0.004115 | 0.225693 | 0.8226 |
| ROE | 0.075401 | 2.313967 | 0.026 | 0.106969 | 2.568927 | 0.0141 |
| EPS | 0.088354 | 3.997381 | 0.0003 | 0.097954 | 4.427391 | 0.0001 |
| **R-squared** | 0.367334 | | | 0.413757 | | |
| **Adj. R-squared** | 0.302445 | | | 0.353630 | | |
| **Prob.(F-stat.)** | 0.00108 | | | 0.000272 | | |

The test for heterogeneity or pooling test explains the variance between the intercepts (α) of the panel cross-sections. Due to the difference in the size of the firm each firm has different intercept. So it is necessary to account for firm-specific effects and its null hypothesis is a test to account for subject-specific effects. The p-value of Breusch-Pagan LM test is less than .05 so we reject $H_0$ of no heterogeneity. According to Baltagi (2013), the dependence at cross-section level is a problem that mostly exists in macro panels with long time series with range of twenty to thirty years. But this problem is not common in micro panels that contain few numbers of years with large cases. The null hypothesis in the cross section dependence test is that the error terms in individual cross section are not serial correlated. For this purpose Pasaran CD test of cross-section dependence is used to check whether the error terms are correlated across individuals. Cross-sectional dependence can lead to preference in tests results. The model is also free from Serial Correlation or cross section dependence of the error term. We are failed to reject the null hypotheses of, no Serial Correlation or cross-section dependence in residuals. So, it is concluded that model has free linear relationship of the error terms at multiple cross-sections and heterogeneity of intercepts (see Table IV). Furthermore fitness of model is estimated by the actual fitted graph. The Figure is showing actual and fitted series with their residual for the period of 2015-2017 for all companies. It is evident from the figure that actual and fitted values of DFL series are very close to each other and the error is so small indicating that model is very fit. Moreover estimated residual has random signal with equal intensity at different frequencies showing the white noise. So, the error term is purely random which means it has zero mean, constant variance (No heterosecdasticity) and serially uncorrelated (See table 4).

 

**Table 4:** Diagnostics

| Null Hypothesis: | Diagnostic Tests | Prob. |
|---|---|---|
| Cross-section random | Hausman Test | 0.2057 |
| No Heterogeneity/subject-specific effects $\sigma^2_\alpha = 0$. | Breusch-Pagan LM | 0.0003 |
| No cross-section dependence in residuals | Pesaran CD | 0.4932 |

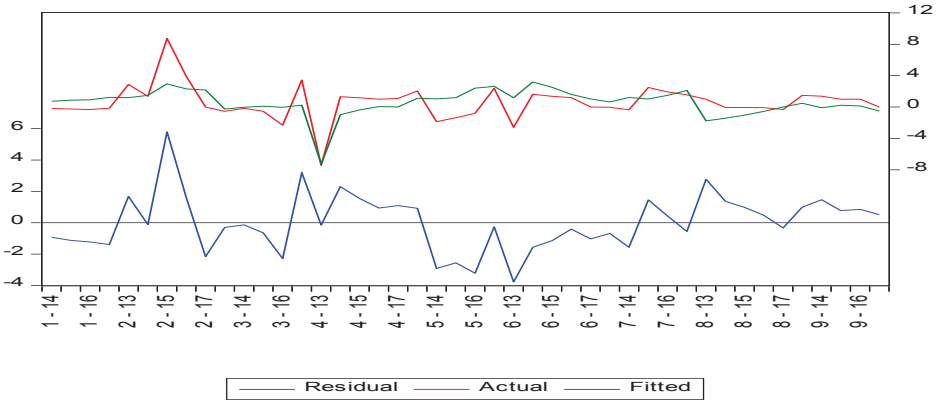


**Figure 1.** Actual Fitted Graph

## 5. Conclusion

On the basis of this study initially the results analyzed and it shows there is significant impact of financial performance on financial leverage in terms of Return on Assets and Earnings per Share. As transform panel random effect model suggest that there is significant impact of financial performance on financial leverage of cement. This thing also confirms by the previous study (Bashir, Fatima, Sohail, Rasul, & Mehboob, 2018). The results also found that returns on equity has positive relationship with financial leverage and confirms. Abhishek & Hussain, (2017) the hypothesized results demonstrate that there is significant positive association of leverage with the return on equity, earnings per share, Net Profit Ratio and ROCE. Furthermore, Earnings per share have also significant impact on the financial leverage. Bashir, Fatima, Sohail, Rasul, & Mehboob (2018) explain that leverage has a EPS has positive and significant raltionship with financial leverage. Earnings per share and leverage has significant relatioship (Jahan & Mostofa, 2017). Moreover the stock returns are positively correlated with leverage (Muradoglu & Sivaprasad, 2013).

To conclude this research, the results can be taken from the preceding evidence over the period of 2009–2015 of Cement industries of Pakistan. The study explained the significance of financial performance and it showed that the cement Industry has good financial performance on the basis of results. Furthermore, the two variables earning per share and returns on equity has significant impact on the degree of financial leverage. This have practical implication when companies wants to increases their profits or shareholder wealth. Furthermore, the net profit margin and return on assets have shown insignificant relationship as it confirms that mostly in cement industries labor work is more than the machine work that creates negative effect and the machines and plants that installed which are not cost efficient. It is good thing to take debt as it helps to improve the financial performance but at the same time the investments made in the industry carefully. The limitation of this research is the sufficiency of data and tax paid and how debt provides tax shield which has also effect on the performance of companies.

## References

Abhishek, A., & Hussain, A. (2017). Empirical study of associationship between capital structure and profitability. *Inspira-Journal of Commerce, Economics & Computer Science, 03*(04), 330-338.

Ahmad, N., Salman, A., & Shamsi, A. F. (2015). Impact of Financial Leverage on Firms' Profitability: An Investigation from Cement Sector of Pakistan. *Research Journal of Finance and Accounting*, 6 (7), 75-80.

Angell, R., & Brewer, B. L. (2003). Improving the Coverage of the DuPont Approach of Financial Analysis in Finance Courses Through the Use of the Net Leverage Multiplier. *Journal Of Economics And Finance Education, 2*(2), 1-5.

Bashir, U., Fatima, U., Sohail, S., Rasul, F., & Mehboob, R. (2018). Internal Corporate Governance and Financial Performance Nexus; a Case of Banks of Pakistan. *Journal of Finance and Accounting, 6*(1), 11-17.

Bhatti, A. M., Majeed, K., Ijaz-ur-Rehman, & Khan, W. A. (2010). Affect of Leverage on Risk and Stock Returns: Evidence from Pakistani Companies. *International Research Journal of Finance and Economics*(58), 32-49.

Eunju, Y., & Soo Cheong, J. (2005). The Effect of Financial Leverage on Profitability and Risk of Restaurant

 

Firms. *Journal of Hospitality Financial Management, 13*(01), 01-18.

Jahan, N., & Mostofa, M. S. (2017). Impact of Leverage on Profitability of Textile Industry of Bangladesh: A Study on Listed Companies in Dhaka Stock Exchange. *Australian Journal of Accounting, Economics and Finance (AJAEF), 03*(02), 51-57.

Ojo, A. S. (2012). The Effect of Financial Leverage on Corporate Performance of Some Selected Companies in Nigeria. *Canadian Social Science, 08*(01), 85-91.

Pachori, S., & Totala, D. N. (2012). Influence of Financial Leverage on Shareholders Return and Market Capitalization: A Study of Automotive Cluster Companies of Pithampur (M.P.), India. *International Conference on Humanities*, (pp. 23-26). Singapore.

Rahman, S. M., Ashraful, M., & Mohiuddin, K. M. (2018). An investigation into the relationship between degree of financial leverage and financial risk of firms: a comparative study between listed mncs and domestic companies of bangladesh. *Asian Economic and Financial Review, 08*(03), 433-448.

Foong, S. ‐ Y., & Idris, R. (2012). Leverage, product diversity and performance of general insurers in Malaysia. *The Journal of Risk Finance, 13*(04), 347-361.

Fasih Ur Rehman, S. S. (2013). Relationship between Financial Leverage and Financial Performance: Empirical Evidence of Listed Cement Companiesof Pakistan. *Global Journal of Management and Business Research Finance, 13*(8), 32-40.

Mehta, A. M. (2014). Myth vs. Fact; Influence of Financial Leverage on Shareholder's Return. *Journal of Finance and Bank Management, 02*(02), 105-114.

Moghadam, M. D., & Jafari, M. (2015). The Role of Financial Leverage in the Performance of Companies Listed in the Stock Exchange. *Indian Journal Of Natural Sciences, 05*(30), 7402-74057.

Modigliani, F., & Miller, M. (1958). "The cost of capital, corporate finance and the theory of investment". *American Economic Review*, 48, 261-97.

Modigliani, F., & Miller, M. (1963). "Corporate income taxes and the cost of capital: a correction". *American Economic Review*, 53, 443-53.

Muradoglu, G. Y., & Sivaprasad, S. (2013). The effect of leverage mimicking portfolios in explaining stock returns variations. *Studies in Economics and Finance, 30*(02), 94-107.

Priswanti, R., Andini, R., & Marsiska , A. (2017). Analysis the effect of return on assets, return on equity, gross profit margin to firm value with leverage as intervening variable case study on textile and garment company listed on bei. *Journal of Accounting, 04*(04), 920-945.

Rahman, S. M., Ashraful, M., & Mohiuddin, K. M. (2018). An investigation into the relationship between degree of financial leverage and financial risk of firms: a comparative study between listed MNCS and domestic companies of bangladesh. *Asian Economic and Financial Review, 08*(03), 433-448.

Yoon, E., & Jang, S. (2005). The Effect of Financial Leverage on Profitability and Risk of Restaurant Firms. *Journal of Hospitality Financial Management, 13*(01), 1-18.