

# The Impact of Capital Structure on the Profitability of Publicly Traded Manufacturing Firms in Bangladesh

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## Abstract

This research explores the impact of capital structure on the profitability of publicly traded manufacturing firms in Bangladesh. In this paper, we applied the fixed effect regression to find out the correlation among independent variables (debt ratio, equity ratio and debt to equity ratio) and dependent variables (return on asset, return on equity and earnings per share). A sample of 50 observations of selected 10 manufacturing companies listed in Dhaka Stock Exchange has been analyzed over the period of 2013 to 2017. This research reveals that the debt ratio and equity ratio have a significant positive impact but debt to equity ratio has a significant negative impact on ROA. This paper also exposes that, equity ratio has a significant positive impact but debt to equity ratio has a significant negative impact on ROE. Finally, debt and equity ratio has a significant negative impact on EPS. Findings of this research will help the listed manufacturing companies to maintain an optimum capital structure which will lead to the maximization of stockholders wealth.

**Keywords:** optimum capital structure, ROA, ROE, EPS, Bangladesh

**JEL Classification:** G32

## 1. Introduction

The capital structure choice of a manufacturing firm is the most significant decision taken by the management of the firm to maximize profits and at the same time minimize costs of capital leads to the maximization of stockholders wealth. Basically, there are two main sources of finance. One is internal finance which is equity and another is external finance which is debt. Most firms use a combination between equity and debt which appearance the capital structure. Modigliani and Miller (1963) stated that capital structure as the mixture between debt and equity that the firm uses in its operation. They also showed the impact of capital structure on firm's performance. After Modigliani and Miller, Jensen and Meckling (1976) discussed the relationship between capital structure and firm performance.

Further, a significant number of researches have been done to depict the impact of capital structure on firm performance in developed and developing countries. In the developed countries aspect, Tailab (2014) did research on American energy, Tifow and Sayilir (2015) did research Turkey manufacturing firm and on United Kingdom manufacturing sector small and medium enterprise (SME). From 2013 forward, most of the research done in capital structure was carried on developing countries. Ogebe, et al. (2013) did research on Nigeria firm performance. Kajanathan and Nimalthasan (2013) did research on Sri Lankan manufacturing firm, Mwangi, et al. (2014) did research on Kenya non-financial listed companies performance, Zeitun and Tian (2014) did research on Jordanian non-financial listed companies and Akeem, et al. (2014) did research on Nigeria manufacturing companies performance. Still, many researchers are trying to find out a better relationship between capital structure and firm performance.

Therefore, this research will help all the financial specialists to realize the impact of capital formation on the firm's profitability. Moreover, this research will help the company manager and stakeholder to understand more about the influence of capital structure and the sensitivity of debt and equity in the firm's activities. It will provide a guideline to the financial manager to design a better capital structure to reduce the cost of capital, raise firm profitability and

ultimately maximize shareholder wealth. At the same time, this study can lead the investor to know more about the effect of capital structure choice on their return and form an optimal capital structure.

## 2. Objectives of the Study

The main objective of the study is to show the impact of capital structure on profitability of publicly traded manufacturing firms in Bangladesh. To fulfill the main objective we pursue the following specific objectives:

- To identify the impact of capital structure on Return on Asset (ROA).
- To identify the impact of capital structure on Return on Equity (ROE).
- To identify the impact of capital structure on Earning per Share (EPS).

## 3. Literature Review

According to Myers (1984), capital structure is the choice of debt, equity or hybrid securities for the firm to finance their business. Roshan (2009) said that capital structure is a financial structure of an entity, is a combination of debt and equity fund maintained by a firm. Finally, Brendea (2011), stated that capital structure is the long-term financing used by an entity while Nirajini and Priya (2013) added that capital structure refers to the way which the entity financed a mixture of long-term capital and short-term liabilities. Modigliani and Millers (1963) indicated that debt finance gives a tax advantage to the firm. The capital structure is relevant to the firm's value and firms are able to maximize their value by raising debt level in their capital structure (Sabin and Miras, 2015). Nirajini and Priya (2013) found a positive relationship between debt and firm profitability. Even M&M theorem have some weakness, but it provided a basic concept for the capital structure and a foundation of other theories (Ahmad, et al., 2012). Ahmeti and Prenaj (2015) also supported MM theory goes beyond the propositions themselves.

Debt to equity formula is total debt divided by total equity. The increasing debt will raise debt to equity. Based on the trade-off theory, debt provides a tax advantage to the company (Obim, et al., 2014). Hence, increase company debt level able to reduce tax expense and raise firm performance. Therefore, debt to equity has a significant positive impact on ROA. Goh et al. (2016); and Nirajini and Priya (2013) also supported this view. Numerous studies were found a different result and indicate a debt to equity has a significant negative impact on ROA (Mwangi, et al., 2014; Sabin & Miras, 2015; Pratheepkanth, 2011; Akeem, et al., 2014; Muhammad, et al., 2014).

Trade-off theory indicated each financial source has own benefit and cost. The firm's optimum capital structure is identified by the trade-off of the benefit and the cost of debt finance (Myers, 1984). Trade-off theory indicated higher profitability firm will be able to gain more tax advantages by increasing borrowing without risking financial distress and apply a higher portion of debt finance in the capital structure. However, trade-off theory criticizes that it is correct under the assumption of no cost of adjustment (Myers, 1984). Besides that, trade-off theory has ignored the effect of retaining earning in the capital structure, retain earning is no cost and no risk. Majority of experimental research in the past established that capital structure has a negative impact on the profitability of the manufacturing firm. Umer et al. (2012) again exposed that there is a negative correlation between capital structure and profitability of the firm. Hadlock and James (2002) concluded that companies prefer debt financing to increase their anticipated return.

Finally, we can say that there is no universal theory of the debt-equity choice. Different views have been published regarding the financing choice. The present study will also investigate the effect of capital structure on profitability of listed firms in Dhaka Stock Exchange in Bangladesh.

## 4. Data and Research Methodology

### 4.1 Data and Variables

A sample of 50 secondary observations has been collected from audited financial statements of 10 manufacturing companies listed in Dhaka Stock Exchange (DSE) during 2013-2017. To make sure valid estimates of the measures, an observation is selected on the basis of some criteria: firms with missing data for any factor in the model during the study period are dropped and sometimes adjusted; firms having the extremist values for any of capital structure are also dropped; Firms having the extremist values for any of performance variables are also dropped. Independent variables to measure profitability and dependent variables to measure capital structure are shown in the following Table 1.

Table 1. Dependent and independent variables

Nature of variables	Symbol	Explanation	Calculation
Independent	DR	Debt Ratio	Total Debt/Total Assets
Independent	ER	Equity Ratio	Total Equity/Total Assets
Independent	DE	Debt to Equity Ratio	Total Debt/Total Equity
Dependent	ROA	Return on Assets	Net Income /Total Assets
Dependent	ROE	Return on Equity	Net Income /Equity
Dependent	EPS	Earnings per Share	Net Income/No. of Shares Outstanding

## 4.2 Econometric Model

The multiple linear regression model used in this study is as follow:

$$P_{it} = \alpha + \beta_1 DR_{it} + \beta_2 ER_{it} + \beta_3 DE_{it} + \varepsilon_{it}$$

Where,

$\alpha$  is constant;

$\beta_1$  to  $\beta_2$  = Coefficient of determinants of independent variables;

$i$  (numbers of manufacturing firms) = 1,2,3,...,10;

$t$  (time-interval) = 1,2,...,5;

$\varepsilon$  is error term.

## 5. Findings and Analysis

### 5.1 Descriptive Statistics

The descriptive statistics show that the mean value of ROA is 0.59642% with a standard deviation of 0.572085%. In addition, the variable ROA record a rather low inconsistency as the value range from -0.7% to 2.86%. The mean value of ROE is 0.899142% with a standard deviation of 1.095714%, the minimum value of ROA is -0.25% and the maximum is 5.66%. Variable EPS presents relatively high inconsistency since its minimum value stands at -0.91% and maximum at 8.66%. The mean value of EPS is 3.72542% with a standard deviation of 2.641485%.

Table 2. Descriptive statistics of the variables used in the regression model

Variables	Observations	Mean	Std. Dev.	Min.	Max.
ROA	50	0.59642	0.572085	-0.7	2.86
ROE	50	0.899142	1.095714	-0.25	5.66
EPS	50	3.72542	2.641485	-0.91	8.66
DE	50	0.834974	0.553487	0.04	2.81
DR	50	0.524006	0.121375	0.255	0.756
ER	50	0.47802	0.125389	0.244	0.77

Source: Results obtained (STATA output) by the authors.

The mean value of debt to equity ratio (DE) is 0.834974% with a standard deviation of 0.553487%. In addition, the variable debt to equity ratio (DE) records moderate variability as the value range from 0.074% to 2.81%. Variable debt ratio (DR) presents a mean value 0.524006% with the standard deviation of 0.121375%. Its variability ranges from 0.255% to 0.756%. Finally, variable equity ratio (ER) has a mean value of 0.47802% with a standard deviation of 0.125389% and record variability ranges from 0.244% to 0.77% which is lowest among all the variables.

### 5.2 Correlation Matrix

The correlation matrix of the financial ratios used in this study is presented in table 3. Equity ratio (ER) has positive correlation with ROA ( $r = 0.0555$ ), ROE ( $r = 0.1113$ ). Where ER has negative correlation with EPS ( $r = -0.2898$ ), DE ( $r = -0.425$ ) and DR ( $r = -0.994$ ).

Table 3. Correlation matrix among variables

	ROA	ROE	EPS	DE	DR	ER
ROA	1					
ROE	0.9094	1				
EPS	0.1008	-0.049	1			
DE	-0.2364	-0.0855	-0.1332	1		
DR	-0.0202	-0.0697	0.2796	0.4405	1	
ER	0.0555	0.1113	-0.2898	-0.425	-0.994	1

Source: Results obtained (STATA output) by the authors.

### 5.3 Regression Result

Table 4. The result of fixed effect regression analysis:

	ROA	ROE	EPS
$\alpha$	-14.6996*	-30.9367*	14.41907
DR	16.03141*	32.32012	-5.31875
ER	15.02894*	31.60325*	-13.9768
DE	-0.34572*	-0.24805*	-1.46762*
R <sup>2</sup>	0.193	0.1634	0.1649
Observations	50	50	50

\* Statistically significant at 5%.

Source: Results obtained STATA output) by the authors.

In table 4, the regression result find debt ratio (DR) and equity ratio (ER) have a significant positive impact but debt to equity ratio (DE) has a significant negative impact on ROA. Equity ratio (ER) has a significant positive impact but debt to equity ratio (DE) has a significant negative impact on ROE. Finally, the debt to equity ratio (DE) has a significant negative impact on EPS. The explanatory power of the three models, (R<sup>2</sup> values) are; 0.193, 0.1634 and 0.1649 respectively. These indicate that 19.3%, 16.34%, and 16.49% of the variation in the Bangladeshi manufacturing firm's return on assets and return on equity, and earnings per share respectively can be explained by the explanatory variables in each model.

### 6. Conclusion

The impact of capital structure on the profitability of the manufacturing firm is analyzed based on descriptive statistics, correlation matrix and fixed effect regression analysis. The regression result shows the debt ratio has a significant positive impact on ROA supported by Modigliani and Miller. Equity ratio has a significant positive impact on ROA and ROE. Finally, the debt to equity ratio has a significant negative impact on ROA, ROE, and EPS. In conclusion, the firms raise debt finance to reduce the cost of capital and enjoy tax advantage but debt level over the optimum capital structure has a significant negative impact on ROA, ROE, and EPS.

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