

Impact of Firm-Specific Variables on Capital Structure of Indian Companies : An Empirical Study

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Abstract

This paper identifies the most important variables of capital structure of selected sample industries that are listed at BSE500 INDEX. The companies that are selected for the research paper comprised both private and public sector companies. Four firm-specific variables are considered to determine the impact of firm-specific variables on Capital Structure during Global financial crisis. These variables are Size of Firm, Growth of Assets, Profitability and Tangibility. The study covered the two time periods i.e. Pre-crisis period (2001-2009) and Post-crisis period (2009-2015).

Key Words

Capital Structure, Leverage, Size of Firm, Growth of Assets, Profitability and Tangibility.

INTRODUCTION

An important factor in the success of a firm is its' capital structure or debt-equity mix. In the long run, a planned capital structure enables firms to mobilise additional funds as and when required and helps in increasing the value of a firm. Thus, the mix or the proportion of debt and equity is the capital structure of a firm is an important financial decision as it affects both the return on capital and the risk of stakeholders particularly shareholders. The use of

debt in the capital structure introduces financial leverage and improves the return on equity. But excessive use of debt component also increases the risk and therefore, the lenders as well as equity shareholders demand a higher return on their investment in order to compensate for the increased risk. The non-use of debt, on the other hand, keeps the equity return depressed. The financial manager has to design the capital structure or its debt-equity mix in such a manner that it maximises the value of the firm. It is generally understood that the optimal capital structure of a firm is that composition of debt and equity which results in the minimum cost of capital. The determination of capital structure in real life is not that simple because it is not an exact science such as the firm's business risk, its financial flexibility, shareholders' wealth maximisation, the nature and degree of competition, survival, assurance of a steady source of funds, operational and financial rating in the market, profitability, growth rate, the state of capital market etc. before taking a decision on the appropriate capital structure which maximizes the value of the firm while minimizes the cost of capital.

SCOPE OF THE STUDY

The scope of the study has been confined to the service sector only. To achieve the objectives of the study, a sample of 87 companies has been selected from Banking, Computer Software and Finance companies forming part of BSE500 Index.

LITERATURE REVIEW

Modigliani, Franco and Miller, Merton H. (1958) in a landmark study examined the relationship between capital structure and the value of the firm. The study indicated that the optimal capital structure happens to be a theoretical concept which in real life, is very difficult to find.

Taub (1975) in a study on "The Determinants of the Firm Capital Structure", examined the major factors influencing the capital structure of the US firms. The researcher investigated a total of 89 firms belonging to a cross-section of industry. The study found mixed results. The rate of return, interest rate and firm size were found to be having a positive relationship with the capital structure of the firms.

Myres, Siddharta (1984) conducted a survey of capital structure decisions by financial executives. He found that the choice of a source of

funds at times is inconsistent with the wealth maximization goals as stated in financial theory.

REFERENCE PERIOD

The present study is divided the whole set of data into two periods : Pre-Crisis Period from April 2001 to March 2009, and from April 2009 to March 2015 as Post-Crisis Period. The study comprised the data of 14 years. This study is based on secondary data.

DATA INPUTS

The following data inputs are used. These are explained below :

- (a) **Profitability** : For this study, profit before interest and taxes by total assets is used. For this study, profit before interest and taxes by total assets is used. The results are confirmed with the findings given under Pecking-Order Theory (Myers, 1984).
- (b) **Growth of Assets** : On the basis of previous studies, the following measure is used for the study :
Growth : Assets at the end of current year - Assets at the end of previous year.
- (c) **Tangibility** : The ratio of fixed assets to total assets is used (Titman and Wessels, 1988); Rajan and Zingles (1995); Pandey (2000).
- (d) **Size of Firm** : The relationship of size with leverage has been found to be not clear. For determining the size of assets, logarithm of total assets has been used for the study (Rajan and Zingales, 1995); (Titman and Wessels, 1988).

DATA ANALYSIS

The following research techniques are used to analyse the data :

1. Multiple Regression Analysis

The capital structure is measured through debt/ equity ratio and debt/ total assets ratio & these variables are taken as dependent variables. The explanatory variables are tangibility, growth of assets, profitability ratio and size of assets as explained in the methodology. For the data analysis, two regression equations are used :

(a) Regression analysis of debt/total assets ratio with firm specific variable are :

The regression equation is :

$$Y_1 = \alpha + \beta_1(X_1) + \beta_2(X_2) + \beta_3 (X_3) + \beta_4 (X_4) + e$$

Where, e refers to error terms :

1. X_1 = GrowthA_Total = Growth of Assets
2. X_2 = SizeA_Total = Size of Assets
3. X_3 = Profit_Total = Profitability Ratio
4. X_4 = Tang_Total = Tangibility
5. Y_1 = Debt / Total Assets Ratio

(b) Regression analysis of debt/equity ratio with firm specific variable are :

The regression equation is :

$$Y_1 = \alpha + \beta_1(X_1) + \beta_2(X_2) + \beta_3 (X_3) + \beta_4 (X_4) + e$$

Where, e refers to error terms;

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3. X_3 = Profit_Total = Profitability
4. X_4 = Tang_Total = Tangibility
5. Y_1 = Debt/ Equity Ratio

(A) Software Companies

H_{01} : There is no significant relationship of leverage (debt/total assets) with firm-specific variables in software companies during pre and post-crisis period.

Table 1 depicts the value of $R^2=0.102$, the predictors or Independent Variables i.e. Tangibility, Growth of assets, Profitability, Size of assets account for 10.2% of variance in debt/ total assets ratio. It is revealed from the above results of software companies that predictors are not significantly affect the debt/total assets ratio (dependent variable). It has been depicted in Anova Table that the overall regression model is not statistically significant, $F(4,14) = 0.398$, $p > 0.05$, $R^2 = 0.102$. Overall, regression results are not statistically significant when four independent variables taken together. They accounted (predicted) for that capital structure not significantly varied during pre and post-crisis period (2001-2009) and (2009-2015) respectively in case of software industry. So, the null hypothesis is accepted. It means that there is no significant relationship of leverage with firm- specific variables in software companies.

Table 1

R		.320^a	
R Square		0.102	
Adjusted R Square		-0.154	
Std. Error of the Estimate		0.61312	
F Change		0.398	
Sign. F Change		0.807	
Annova	F	0.398	
	Sign.	.807 ^a	
Coefficients	Beta	t-value	p-value
(Constant)		0.462	0.651
GrowthA_Total	-0.132	-0.486	0.634
SizeA_Total	0.082	0.258	0.800
Profit_Total	-0.253	-0.843	0.413
Tang_Total	0.279	0.927	0.369

Source : Researcher's Own Calculations

a. Dependent Variable : Debt / Total Assets Ratio

Predictors : (Constant), Growth of Assets, Size of Assets, Profitability, Tangibility.

(B) Banking Companies

H_{o2} : There is no significant relationship of leverage (debt/total assets) with firm-specific variables in Banking companies during pre and post-crisis period.

Table 2 depicts the value of $R^2 = 0.490$, the predictors or Independent Variables i.e. Tangibility, Growth of assets, Profitability, Size of assets account for 49% of variance in debt/total assets ratio. It is revealed from the above results of banking companies that predictors (Independent variables) are significantly affect the debt/total assets ratio (dependent variable). It has been depicted in Anova Table that the overall regression model is statistically significant, $F(4,29) = 6.594$, $p < 0.05$, $R^2 = 0.490$. So, the null hypothesis is rejected. It means that there is a significant relationship of leverage with firm-specific variables during pre and post-crisis period (2001-2009 and 2009-2015). They accounted (predicted) for that capital structure significantly varied during pre and post crisis period (2001-2009) and (2009-2015) respectively in case of banking industry. The results revealed that size of assets and profitability are

the significant predictors of debt/ total assets with ($p < 0.05$). But the growth of assets and tangibility are not the significant predictor of debt / total assets ratio.

Table 2

R		.700a	
R Square		0.49	
Adjusted R Square		0.419	
Std. Error of the Estimate		1.512593	
F Change		6.954	
Sign. F Change		0	
Anova	F	6.954	
	Sign.	.000a	
Coefficients	Beta	t-value	p-value
(Constant)		1.662	0.107
GrowthA_Total	-0.271	-1.784	0.085
SizeA_Total	0.363	2.591	0.015
Profit_Total	0.434	2.942	0.006
Tang_Total	-0.059	-0.43	0.671

Source : Researcher's Own Calculations

a. Dependent Variable : Debt / Total Assets Ratio

Predictors : (Constant), Growth of Assets, Size of Assets, Profitability, Tangibility.

(C) Finance Companies

H_{03} : There is no significant relationship of leverage (debt / total assets) with firm-specific variables in Finance companies during pre and post-crisis period.

Regression analysis of debt/total assets ratio with firm specific variables are :

Table 3

R		.784a	
R Square		0.615	
Adjusted R Square		0.553	
Std. Error of the Estimate		10.4756	
F Change		9.971	
Sign. F Change		0	
Anova	F	9.971	
	Sign.	.000 ^a	
Coefficients	Beta	t-value	p-value
(Constant)		-2.353	0.027
GrowthA_Total	0.133	0.948	0.352
SizeA_Total	0.871	5.312	0.000
Profit_Total	-0.241	-1.457	0.158
Tang_Total	-0.214	-1.588	0.125

Source : Researcher's Own Calculations

a. Dependent Variable : Debt / Total Assets Ratio

Predictors : (Constant), Growth of Assets, Size of Assets, Profitability, Tangibility.

Table 3 depicts the value of $R^2 = 0.784$, the predictors or Independent Variables i.e. Tangibility, Growth of assets, Profitability, Size of assets account for 78.4% of variance in debt / total assets ratio. It is revealed from the above results of finance companies that predictors (Independent variables) are significantly affect the debt / total assets ratio (dependent variable) with ($p < 0.05$). It has been depicted in Anova Table that the overall regression model is statistically significant, $F(4,25) = 9.971$, $p < 0.05$, $R^2 = 0.784$. So, the null hypothesis is rejected. It means that there is a significant relationship of leverage with firm-specific variables during pre and post-crisis period (2001-2009 and 2009-2015). But the growth of assets, profitability and tangibility are not the significant predictors of debt / total assets ratio.

Software Companies

H_{04} : There is no significant relationship of leverage (debt / equity) with firm-specific variables in software companies during pre and post-crisis period.

Table 4

R		0.357	
R Square		0.128	
Adjusted R Square		-0.122	
Std. Error of the Estimate		4.121145	
F Change		0.128	
Sign. F Change		0.728	
Annova	F	0.512	
	Sign.	0.728	
Coefficients	Beta	t-value	p-value
(Constant)		2.813	0.014
GrowthA_Total	-0.256	-0.958	0.354
SizeA_Total	-0.112	-0.356	0.727
Profit_Total	0.245	0.831	0.420
Tang_Total	-0.285	-0.962	0.352

Source : Researcher's Own Calculations

a. Dependent Variable : Debt / Equity Ratio

Predictors : (Constant), Growth of Assets, Size of Assets, Profitability, Tangibility.

Table 4 depicts the value of $R^2 = 0.128$, the predictors or Independent Variables i.e. Tangibility, Growth of assets, Profitability, Size of assets account for 12.8% of variance in debt / equity ratio. It is revealed from the above results of Software Companies that predictors do not significantly affect the debt/equity ratio (dependent variable) Overall, regression results are not statistically significant when four independent variables taken together. They accounted (predicted) for that capital structure not significantly varied during pre and post-crisis period (2001-2009) and (2009-2015) respectively in case of software industry. So, the null hypothesis is accepted. It means that there is no significant relationship of leverage with firm-specific variables in software companies.

Banking Companies

H_{05} : There is no significant relationship of leverage (debt / equity) with firm-specific variables in Banking companies during pre and post-crisis period.

Table 5

R		.812a	
R Square		0.659	
Adjusted R Square		0.612	
Std. Error of the Estimate		0.428833	
F Change		14.016	
Sign. F Change		0.000	
Annova	F	14.016	
	Sign.	.000 ^a	
Coefficients	Beta	t-value	p-value
(Constant)		-2.986	0.006
GrowthA_Total	0.742	5.988	0.000
SizeA_Total	0.067	0.588	0.561
Profit_Total	0.53	4.399	0.000
Tang_Total	0.197	1.741	0.092

Source : Researcher's Own Calculations

a. Dependent Variable : Debt / Equity Ratio

Predictors : (Constant), Growth of Assets, Size of Assets, Profitability, Tangibility.

Table 5 depicts the value of $R^2 = 0.659$, the predictors or Independent Variables i.e. Tangibility, Growth of assets, Profitability, Size of assets account for 65.9 % of variance in debt/ equity ratio. It is revealed from the above results of Banking companies that predictors (Independent variables) significantly affect the debt/equity ratio (dependent variable). The null hypothesis is rejected. It means that there is a significant relationship of leverage with firm- specific variables during pre and post crisis period (2001-2009 and 2009-2015). So, regression is a good fit model for the analysis. Overall, regression results are statistically significant when four independent variables taken together. The size of assets and tangibility are not the significant predictors of debt / equity ratio.

Finance Industry

H_{06} : There is no significant relationship of leverage (debt/equity) with firm-specific variables in Finance companies during pre and post-crisis period.

Table 6

R		.574a	
R Square		0.330	
Adjusted R Square		0.223	
Std. Error of the Estimate		6.231127	
F Change		3.078	
Sign. F Change		0.034	
Annova	F	3.078	
	Sign.	.034 ^a	
Coefficients	Beta	t-value	p-value
(Constant)		3.464	0.002
GrowthA_Total	-0.022	-0.119	0.906
SizeA_Total	-0.698	-3.229	0.003
Profit_Total	0.463	2.123	0.044
Tang_Total	0.003	0.015	0.988

Source : Researcher's Own Calculations

a. Dependent Variable : Debt / Equity Ratio

Predictors : (Constant), Growth of Assets, Size of Assets, Profitability, Tangibility.

As it is seen in Table 6, the $valu^e = 0.330$, the predictors or Independent Variables i.e. Tangibility, Growth of assets, Profitability, Size of assets account for 33% of variance in debt / equity ratio. It has been depicted in Anova Table that the overall regression model is statistically significant, $F(4,25) = 3.078$, $p < 0.05$, $R^2 = 0.330$. So, the null hypothesis is rejected. It means that there is a significant relationship of leverage with firm-specific variables during pre and post crisis period (2001-2009 and 2009-2015). So, regression is a good fit model for the analysis. Overall, regression results are statistically significant when four independent variables taken together. They accounted (predicted) for that capital structure significantly varied during pre and post-crisis period (2001-2009) and (2009-2015) respectively in case of finance industry. But the growth of assets, profitability and tangibility are not the significant predictors of debt / total assets ratio with ($p > 0.05$).

FINDINGS

1. The regression results state that relation of growth of assets has been found to be negative with debt/equity ratio as well as debt/

total assets ratio and statistically insignificant in Software and Banking industry whereas in case of Finance industry relation between debt/equity ratio with growth of assets has been found to be positive and significant. It is observed that in case of Banking industry relationship of debt/equity ratio with growth of assets is found to be positive and significant. Overall, regression results depicted that growth of assets has negative relation with leverage. This finding is consistent with Pecking Order theory. If there is higher degree of growth of assets, the lesser should be the amount of leverage/debt in its capital structure.

2. The regression results depict that relation of first measure of leverage which is taken as debt/total assets ratio with size of assets has been found to be positive and significant in case of banking and finance industry whereas in case of software industry, the relation between them is found to be negative and insignificant. For the second measure of leverage which is observed as debt/equity ratio, the relation is found to be negative and significant in case of finance industry whereas in case of software industry, the relationship of size with leverage found to be negative and insignificant. The negative sign of this effect supports the Pecking Order theory and other researches viz. Rajan and Zingales (1975), Titman and Wessels (1988). The positive relation of size assets with leverage states that if the size of assets is larger than amount of leverage / debt is also larger in its capital structure. This effect supports the Static Trade off theory.
3. The relation of profitability with leverage is found to be positive and statistically significant in case of banking industries when the both measures of leverage taken together. However, in case of first measure of leverage which is taken as debt/ total assets ratio, relation of profitability is found to be negative and insignificant in software and finance industry. But in case of second measure of leverage which is taken as debt/ equity ratio, relation between them is found to be positive and significant in finance industry, insignificant in software industry. The results are consistent with the assumptions of Pecking Order theory. It states that higher profitable companies prefer internal source of financing than using of leverage/ debt in its capital structure.

4. The result from multiple regression states that the relationship among tangibility and leverage is found to be positive and insignificant in case of banking and finance industry when the second measure of leverage which is taken as debt/equity ratio was taken. But in case of first measure of leverage which was calculated with debt/ total assets ratio, the relation of leverage with tangibility was found to be positive and insignificant. The results state that tangibility of assets were found to be negatively related with leverage when the first measure of leverage taken in case of banking and finance industry. The negative sign of relationship with leverage states that firms with larger tangibility will have lower financial leverage. This supports the assumptions given under Pecking Order theory and other researches viz. Pandey *et al.* (2011).

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