



Capital Structure and Profitability: Case Of National Stock Exchange

KEYWORDS

Profitability, Capital Structure, Firm Size, Liquidity

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ABSTRACT *Capital Structure refers to the various financing options of the assets by a firm. A business concern can go for different levels of the mixtures of equity, debt and/or other financial facilities with equity having the emphasis on maximizing the firm's value. Capital Structure affects the liquidity and profitability of a firm. In our research we have tried to examine the effect of Capital Structure on the profitability of firms listed on National Stock Exchange. In this regard we have selected a sample of 30 non financial firms for a period of five years from 2007 – 2011. For analysis purpose, we have used Pearson's correlation, and regression analysis. Pooled ordinary least square model is used in the estimation of a function relating to the Net operating profitability with the independent variables including Debt Ratio, Long Term Debt to Liabilities, Equity to Liabilities and size of the Firm measured in terms of natural logarithm of sales. The results indicate that the capital structure of the non financial firms listed on National Stock Exchange has a significant effect on the profitability of these firms. If these firm want to increase their profitability, they will have to give due consideration to the financing mix, otherwise it may suffer from losses.*

1. Introduction:

Capital Structure refers to the various financing options of the assets by a firm. A business concern can go for different levels of the mixtures of equity, debt and/or other financial facilities. This may be lease financing, term financing, debentures, direct loans from bank etc with equity having the emphasis on maximizing the firm's value. Not all the firms use a standardized capital structure they differ in their financial decisions in various terms. It is a difficult decision for the firms to determine the capital structure in which risk and cost is minimum and can give high profits, and therefore can increase the value of share holders. This difference of choices about the financing decisions gives rise to the various capital structure theories.

According to Tradeoff Theory (TOT) by Miller, (1977) if firms are more profitable they prefer debt financing as compared to equity for the sake of profit. It is driven by three forces. First more debt in a firm's capital structure allows more tax benefits as their tax liabilities come lower and even in some cases it is waved off. So firms having more profits go for more debt rather equity. Secondly if a firm has low profit than there are greater chances of bankruptcy. So, if the firm takes more debt there are more chances that it is bankrupt and as a result of this investor cannot trust on it. Alternatively, if firm have more profits there are less chances of bankruptcy so investor trust and firm tend to be earn more profit. Third force is the agency cost which has to be borne by investor or shareholder. It is a cost which is in form of interest rate because creditor always check the position of the company and monitor the management so if firm has good image than it can get loan at lower cost because creditors are not worry about bankruptcy and there agency cost is very low. Ju, Parrino, Potesman and Weisbach, (2005) Highlighted that Miller, (1977) characterizes the discrepancy by comparing the trade-off between tax gains and bankruptcy costs as "like the recipe for the fabled horse-and-rabbit stew – one horse and one rabbit".

According to Pecking Order Theory (POT), developed by Myers and Majluf, (1984) and Myers, (1984), firms having high profits they attain low debt because when firms are more profitable their first priority is to generate financing through internal resources which means that companies generate financing through retained earnings because it can maximize the value of existing share holders. If retained earnings are not sufficient, the firms go for debt and if further financing is required, they issue equity. The retained earning is preferred

because it almost has no cost, but if the external resources are used for financing like issuance of new shares it may take very high cost. The POT is a result of information asymmetries existing between insiders of the firm and outsiders. The model leads managers to adapt their financing policy to minimize the associated cost. It means that they will prefer internal financing to external financing and risky debt to equity.

In both theories investment opportunities tend firms to use less debt. As the capital structure has many dimensions such as leverage, size, growth, it is very difficult to state that which proportion is the best to maximize the firm's value to the share holders. There is no final decision that profits have positive relations with debt or retained earnings. It is still debatable. However, uniqueness of the firm's product also influences the capital structure of the firm. As due to the uniqueness of the products the availability of substitutes for liquidation of such firms is a bit difficult. In addition the industrial classifications also impact the capital structure as the variety of intensity of the basic factors may also influence the structure. Furthermore, the duration of financial requirements also induces firms to go either for debt or equity. As in the case of long-term endeavours the firms may prefer equity and find it cheaper compared to the debt, while on the short-run the debt is more convenient as financing alternative.

This study is an endeavour to know the relationship between capital structure & profitability of non-financial firms listed on National Stock Exchange because there are number of studies on the determinants of capital structure but as far as the impact of capital structure on profitability is concerned they are few.

1.1. Objectives of Study

The objective of our research is to make effort to know the relationship between Capital Structure and profitability for non financial firms listed on National Stock Exchange for period 2007-2011 in India. The principal objective of our research is to find out the relationship between capital structure and profitability for non financial firms listed on National Stock Exchange. The relationship of debt financing, long term debt, equity financing and size on the profitability of non financial firms listed on National Stock Exchange will also be estimated.

1.2. Limitations of Study

We have used the data for the year 2007 – 2011 for non financial firms listed on National Stock Exchange (NIFTY In-

dex). The data prior to this period was not available in National Stock Exchange. So we remain limited to these five years. In addition the annual reports for all the selected firms were not available for year 2006 which restricted our period to 2007. There are 50 firms in National Stock Exchange (NIFTY Index) but sector like banking, finance, and insurance industries has been excluded from the study so our sample is 30 non financial firms.

2. Literature Review

Review of the literature is aimed on grouping and assessment of what endorsed researchers have written on a topic, organized in a manner which addresses the research objective. Many researchers have studied capital structure from different views and in different environments. The following ones are very interesting and useful for our research:

Buferna, Bangassa and Hodgkinson, (2005) report that the theories, static trade-off theory and agency cost theory are applicable on the capital structure of the companies in Libya. However, they further reveal that a very little evidence is there to support the theory of asymmetric information. They are of the view that in developing countries the secondary market lacks in many cases which affect agency cost, as the shareholders cannot offload and exert more pressure on management to work for their interests. They conclude that the equity agency cost is the main reason of conflict between shareholders and debtors which is more problematic for private companies. They further support the importance and application of agency cost theory for private companies in their capital structure decisions.

Christopher, Schafer and Talavera, (2006) focus that there is strong effect of short term and long term debt on profitability and according to them the organization which prefer to financing through long term debt has low profitability and alternatively if firm use short term financing, it earns more profits. In this study they take data from 1988 to 2000 period and proved the hypothesis that the firms using short term financing are relatively more profitable than the firms using long term debt.

Andrea and Mateus, (2003) while going through an empirical research on capital structure choices follow the Booth et. al. (2001) which is evident of the fact that the capital structure decisions of firms in developing countries are influenced by the same variables as in the developed countries. They have tested the same variables for Portugal and Hungary where firms decide to have a combination of debt/equity in their capital structure. They reveal that although these factors are the same but differ to some extent because the ratios are affected by country factors like inflation, status of capital market, growth rates of the country. They also embark upon the verification of the Pecking – Order theory, asymmetric information, and agency costs theories and concluded that the more profitable companies have lower debt ratios which conform to the Pecking-Order theory.

Pandey, (2004) explains the relationship between (capital structure and market structure) and (Capital Structure and Profitability). The results suggest that the capital structure and market structure have cubic relationship that at lower and high range of Tobin Q ratio (sum of market value of equity and book value of long term debt and net current assets divides by book value of equity and book value of long term debt and net current assets) firms are using high debt and at medium range they use less debt. This is due to agency cost and bankruptcy costs because when firms take more debt there are chances of bankruptcy because the firms might not able to repay the debt in future. Regarding relationship between profitability and capital structure they conclude that there is a saucer-shape relationship between capital structure and profitability because of the interplay of agency costs, costs of external financing and the interest/tax shield. In addition to this they also conclude that other independent vari-

ables like size and tangibility has a positive influence while growth, risk and ownership have a negative influence on capital structure.

All the above studies provide us a solid base and give us idea regarding capital structure and profitability. These studies also gives us the results and conclusions of those researches already conducted on the same area for different countries and environment from different aspects. On the basis of these researches done in different countries, we have developed our own methodology for research.

3. Methodology

The purpose of this study is to make effort to know the relationship between the capital structure and profitability of the firms listed on National Stock Exchange.

3.1. Sample & Source of Data

There are 50 firms in National Stock Exchange (NIFTY Index) including 32 non financial firms. The data for all non financial firms was not available on National Stock Exchange which restricted our sample to 30 non financial firms. The data used in this research is obtained from the annual reports of 30 non financial firms listed on National Stock Exchange (NIFTY Index) including firms from different sectors of our economy. The major sectors included in the study are textile spinning, textile composite, power generation and distribution, oil and gas, chemical and pharmaceutical, paper and board, cement etc. Because of the specific nature of their activities, firms in financial sector, banking and finance, insurance, leasing, business services, renting and other services are excluded from the sample. These annual reports were collected from National Stock Exchange for a period 2007 to 2011.

3.2. Variables

To assess the profitability of the firms, Net Operating Profitability (NOP) is used as Dependant variable; it is calculated by dividing the Net Profitability plus depreciation by the total assets. The following variables are used as Independent variable for regression: Debt Ratio (DR) is calculated by dividing total debt of a firm by its total assets, Long term debt to total liabilities (LTDTL) is used to see the long term debt financing by the firm, and Shareholders equity to total liabilities (SHETL) for representing the equity financing and Natural logarithm of sales (LOS) for size of the firm.

3.2. Hypotheses Testing

In this part of our paper we develop our research hypotheses. We have made a set of hypotheses to show the effect of capital structure on the profitability.

- 1.) Ho1 Firms with high %age of debt are more profitable.
H11 Firms with high %age of debt are less profitable.
- 2.) Ho2 Firms with more long term debt are more profitable.
H12 Firms with more long term debt are less profitable.
- 3.) Ho3 Firms with high equity to total liabilities are less profitable.
H13 Firms with high equity to total liabilities are more profitable.
- 4.) Ho4 Firms having big size are less profitable.
H14 Firms having big size are more profitable.

3.5. Types of Analysis

Descriptive and quantitative analysis is used for this research. Descriptive analysis presents mean, standard deviation, maximum and minimum value for each variable used in the study. In quantitative analysis, Pearson's correlation and regression analysis is used. In regression analysis pooled ordinary least square is used to investigate the relationship and also to prove the hypotheses. It features a wide variety of tools designed to facilitate working with panel or pooled/time series-cross section data.

3.6. Model Specifications

$$NOP_{it} = \beta_0 + \sum_{all}^n \beta_i X_{it} + \varepsilon$$

NOP_{it} : Net operating profitability of firm i at time t ; $i = 1, 2, \dots, 31$ firms.

β_0 : The intercept of equation.

β_i : Coefficients of X_{it} variables.

X_{it} : The different independent variables for working capital management of firm i at time t .

t : Time = $1, 2, \dots, N$ (in this study $N = 94$ firms).

ε : The error term.

The above general least square equation with specified variables will be as follow the equation will be:

$$NOP_{it} = \beta_0 + \beta_1(DR_{it}) + \beta_2(LTDTL_{it}) + \beta_3(SHETL_{it}) + \beta_4(LOS_{it}) + \varepsilon$$

NOP = Net Operating Profitability

DR = Debt Ratio

$LTDTL$ = Long term debt to total liability

$SHETL$ = Shareholder's Equity to total liability

LOS = Natural log of total sale

ε = corresponds to error term

4. Data Analysis & Discussion

The results of descriptive and quantitative analysis are presented below. The first table shows the results of descriptive analysis which include the mean, Median, standard deviation, minimum and maximum value for each variable included in the study.

The descriptive Statistics of variables used in this study are presented in Table 1

Table 1
Descriptive Statistics
30 Indian Non - financial firms, 2007-2011, 150 firms - year observations

	NOP	DR	LTDTL	SHETL	LOS
Mean	0.240	0.233	0.187	0.045	9.014
Median	0.202	0.147	0.106	0.024	9.229
Standard Deviation	0.215	0.221	0.193	0.075	2.018
Kurtosis	6.740	-0.598	-0.172	17.943	7.770
Skewness	1.846	0.758	0.933	4.066	-2.278
Minimum	-0.444	0.000	0.000	0.002	5.604
Maximum	1.351	0.912	0.813	0.464	12.422
Count	150.000	150.000	150.000	150.000	150.000

Source: Calculations Based on Annual reports of firms from 2007-2011.

In the above table Net operating profitability has a mean value 0.240 with a deviation from the mean value by .215. The maximum profitability for a firm in any year is 135% while the minimum is -44%. To check the debt financing and its relationship with the profitability the debt ratio (obtained by dividing the total debt of the company by the total assets) is used. The Results of descriptive statistics show that the average debt ratio for the firms listed on National Stock Exchange is 23.3% with a standard deviation of 22.1%. The maximum debt financing used by a company is 91.2% which is unusual but may be possible. The minimum level of the debt ratio is 0.00%. The long term debt to total liabilities indicate that on average firms use 18.7% of long term debt in their liabilities with a standard deviation of .193. To check the size of the firm and its relationship with profitability, natural logarithm of sales is used.

Size of the firm also indicates that whether it should go for debt or equity financing. The mean value of log of sales is 9.014 while the standard deviation is 2.018. The maximum value of log of sales for a company in a year is 12.422 and the minimum is 5.604.

4.1. Correlation analysis

In our analysis we used correlation as a tool of statistics to see the relationship between capital Structure and profitability.

The results of correlation analysis are discussed in table 2.

The correlation for debt ratio with profitability is -.491 which reveals that the two variables negatively correlated with each other meaning thereby that if one variable increase the other decreases and it is significant at 1%. The result for the relationship of long term debt with profitability is negative and the correlation coefficient is -.485 and it is also significant at 1% level of significance.

Table 2
Pearson Correlation Coefficients
30 Non - financial firms, 2007-2011, 150 firms - year observations

Correlations		NOP	DR	LTDTL	SHETL	LOS
NOP	Pearson Correlation	1	-.491**	-.485**	.128	.143
	Sig. (2-tailed)		.000	.000	.119	.080
	N	150	150	150	150	150
DR	Pearson Correlation	-.491**	1	.916**	-.213**	.156
	Sig. (2-tailed)	.000		.000	.009	.057
	N	150	150	150	150	150
LTDTL	Pearson Correlation	-.485**	.916**	1	-.169*	.130
	Sig. (2-tailed)	.000	.000		.038	.112
	N	150	150	150	150	150
SHETL	Pearson Correlation	.128	-.213**	-.169*	1	-.293**
	Sig. (2-tailed)	.119	.009	.038		.000
	N	150	150	150	150	150
LOS	Pearson Correlation	.143	.156	.130	-.293**	1
	Sig. (2-tailed)	.080	.057	.112	.000	
	N	150	150	150	150	150

** . Correlation is significant at the 0.01 level (2-tailed).
* . Correlation is significant at the 0.05 level (2-tailed).

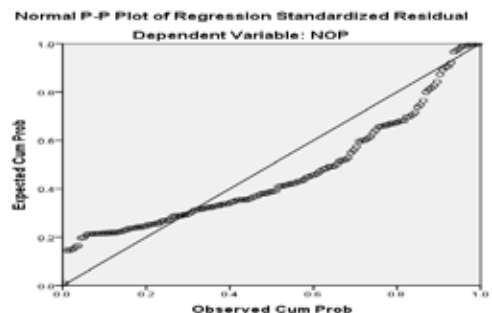
Notes: 1- Net Operating Profitability (NOP) = (Net Income + Depreciation) / Total Assets. 2- Debt Ratio (DR) = Total Debt / Total Assets. 3- Long term debt to total liabilities (LTDTL) = Long term debt / Total debt. 4- Equity to total liabilities (SHETL) = Share holders equity / Total debt. 5-Size (LOS) = Natural logarithm of sales.

The correlation among the equity to total liability with profitability is comes to the level of .128 has a positive sign which means that the variables have direct correlation with each other but is not significant. The correlation between size of the firm and profitability is .143 positive which means that with the growing size of the firm the profitability increases. It is not significant.

4.2. Regression Analysis

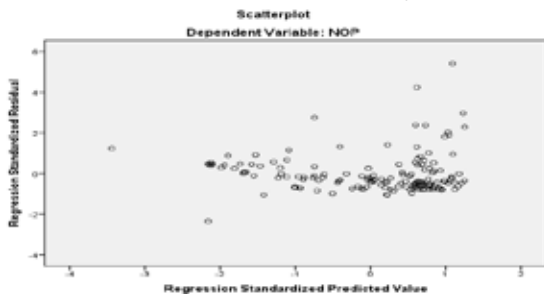
This regression is estimated using the pooled least squares method. The results are shown in Table 3.

Normality of Error:



The normal probability plot of residual roughly follows a straight line so it does not violate the assumption of normality.

Constant error Variance (Homoscedasticity):



constant error variance or homoscedasticity.

Outliers:

Descriptive Statistics		
	N	Maximum
Cook's Distance	150	.14566
Valid N (listwise)	150	

We use cook's distance value to check whether strange or extreme case is having any undue influence on the result of our model. According to Tabachnic and Fidell (2007, pp 75),

Coefficients ^a											
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	.104	.075		1.387	.168					
	DR	-.301	.170	-.310	-1.772	.048	-.491	-.146	-.123	.157	6.375
	LTDTL	-.242	.193	-.217	-1.257	.001	-.485	-.104	-.087	.160	6.249
	SHELT	.282	.212	.098	1.327	.001	.128	.110	.092	.882	1.133
	LOS	.026	.008	.249	3.416	.001	.143	.273	.236	.905	1.105

a. Dependent Variable: NOP

The results of this regression indicate that the coefficient of debt ratio is (-.301) negative and is highly significant at $\alpha = 5\%$. It implies that the increase or decrease in debt ratio will significantly affect the profitability of firms. It means that if leverage of the firms increases, it will adversely affect its profitability.

The results for Long term debt to total liabilities (LTDTL) are quite significant. The regression coefficient is (-.242) means there is inverse relation between the long term debt and profitability. If the firms will keep on increasing the long term debt it will lead to decrease the profitability as the long term debt financing is always costly.

The result for shareholders equity to total liabilities is also significant and there is positive relationship between (SHELT) to net operating profitability. The coefficient is (.282) and is highly significant at $\alpha = 1\%$. It means if the firm increases there equity financing it can increase its profitability.

Similarly log of sales used as proxy for size of a company shows a significant positive relationship with profitability which means that bigger size firms have more profitability compared to firms of smaller size.

The adjusted R² also called the coefficient of multiple determinations, is the percent of the variance in the dependent explained uniquely or jointly by the independent variables and is 28.6% which shows that there is 28.6% variation in the dependent variable attributable to the independent variables. The C is the constant, where the regression line intercepts the y axis, representing the amount the dependent y will be when all the independent variables are 0. Finally we discuss intercept which is constant in this case the intercept is 0.104.

case with value more than 1 are a potential problem. In our case maximum Cook's distance value is 0.14566, suggest no major problems.

Table 3
Pooled Ordinary Least Square
30 Non - financial firms, 2007-2011, 150 firms – year observations
Dependent Variable: NOP

Model Summary ^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.553 ^a	.306	.286	.181483

a. Predictors: (Constant), LOS, LTDTL, SHELT, DR

b. Dependent Variable: NOP

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.102	4	.526	15.956	.000 ^b
	Residual	4.776	145	.033		
	Total	6.878	149			

a. Dependent Variable: NOP

b. Predictors: (Constant), LOS, LTDTL, SHELT, DR

The F statistic is used to test the significance of R. Overall; the model is significant as F-statistics is 15.956.

In this case debt ratio has Beta coefficient 0.310 (ignoring negative sign), LTDTL, SHELT and LOS Beta coefficient is 0.217, 0.098, 0.249. This means that debt ratio makes the highest contribution to explaining the dependent variable.

There is no presence of multicollinearity because VIF value for all independent variable is less than 10 and tolerance value for all independent variable is more than 0.1

We get an indication of unique contribution of the particular independent variable to the total R square using square of part correlation value. In this case Debt ratio independent variable has part correlation co-efficient of -0.123, indicating that Debt ratio uniquely explains 1.51% variation in dependent variable NOP. When we seen LOS has part correlation co-efficient is 0.236, which indicating 5.57% variation in dependent variable NOP.

5. Conclusion

We conclude in a fashion that our numeric verifications and statistical analysis shows negative relationship between net operating profitability and debt ratio which verify our first hypothesis and it was also proved by the Jose Marcos in his study.

Secondly there is negative relationship between the long term debt and profitability verifying our second hypothesis which means that firms with having more long term debt are less profitable. This can be attributed to the interest cost bear by the company for a long term debt financing, which increase the fixed costs of the product and resultantly decrease the profitability.

Thirdly the relationship of profitability with %age of equity in the total financing has direct relationship meaning thereby more equity leads to more profits. This is also in consistency with our first hypothesis where more long term debt lead to less profitability hence the third Hypothesis stands proven.

Fourthly size with profitability numerical calculations have accepted our fourth hypothesis that with the increase in size of the firm the profitability increases. As we have taken the N-log of sales as our proxy for growth in size and the increase in sales result in more profits.

Our results are consistent with (Christopher, Schafer and Talavera, 2006), (Andrea and Mateus, 2003), (Voulgaris, Asteriou and Agiomirgianakis, 2002) and Mesquita and Lara etc.

So the war between pecking order theory and trade off theory for the non financial firms listed on National Stock Exchange has been won by the first one which is pecking order theory that the firms having more profitability tend to use less debt in their financing decisions and the firms having less profit are influenced to have more debt.

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