

DETERMINANTS OF CORPORATE CAPITAL STRUCTURE: WITH SPECIAL REFERENCE TO INDIAN SUGAR INDUSTRY

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Abstract:

The optimum capital structure has been defined as combination of both debt and equity that leads to maximum value of the firm and overall cost of capital is minimum. The importance of an appropriate capital structure is, thus, obvious.

The capital structure decision can influence the value of the firm through the earning available to the share holder which maximize the shareholders wealth, capital structure can affect the value of the company by affecting either its expected earnings or cost of capital both. While it is true that financing-mix cannot affect the total earning of the firm as they are determined by investment decisions, it can affect the shareholders earning belonging to the ordinary share holders. Factors Influencing Capital Structure are 1.Economic Factors: State of capital Market, Policy of Term financing Institutions, Taxation. 2. Industry Factors: Stage of Life Cycle, Industry Policy. 3. Firm Specific Factors: Size of Business, Asset Structure, Stability of earning, Credit Standing. 4. Other Factors: Cost of Capital, Cost of floatation, Regulatory Norms etc.

Purpose of the Research: Some recent empirical studies have attempted to through light on capital structure issues. The primary purpose of the study is to obtain insights into the problem by the Sugar sector. On the basis of literature review up till now some of the specific objectives are to examine whether and how Capital Structure (Debt-Equity Ratio) effect of growth, profitability, Size, Business risk, non-debt tax of the firm.

Methodology: The study attempts to analyze the important determinants of capital structure in Sugar. The data for analysis are drawn from company's official websites for a period of 2002 to 2012; all the listed companies from sugar sector had taken for analysis. On the basis of regression model Multiple Regressions, ANOVA and t- test are applied to analyze the data.

Findings: Asset structure (As) has negative relationship with leverage and debt service capacity (Ds), growth of the company (Gr) and tax-shield(Ts) have positive relationship with leverage..

Keywords: Capital Structure, Debt-Equity Ratio, Size of the company, Growth of the Company, Business risk, Tax-Shield.

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Introduction:

The optimum capital structure has been defined as a combination of both debt and equity that leads to the maximum value of the firm and where overall cost of capital is minimum. This is still one of the most debatable issue in the corporate finance research since Modigliani and Miller's (1958) irrelevance proposition. While this proposition has derived various conditions under which capital structure is irrelevant for investment, subsequent theoretical and empirical evidences have shown that a firm can influence its value and future investment by varying in capital structure. The capital structure decision can influence the value of the firm through the earning available to the share holders which maximizes the share holders' wealth. Capital structure can affect the value of company by affecting either its expected earnings or the cost of capital or both. While it is true that financing mix cannot affect the total earning of the firm as they are determined by the investment decisions, it can affect the share of earnings belonging to the ordinary shareholders. The mixing process depends upon the cost and benefits of debts and equity financing in that period (Fischer, Heinkel and Zechner, 1989). The pecking order theory of capital structure can explain why the most profitable firms tend to borrow less. Less profitable firms first issue debt because it has lower flotation and information costs compared to equity is issued only as a last resort, when the debt capacity is fully exhausted. Tax benefits of debts are a second order effect. Therefore, the debt ratio changes when there is an imbalance between internal funds and real investment opportunities and there is information asymmetry in the market (Myers and Majluf, 1984). High degree of information asymmetry increases the leverage due to the absence of informational cost in the form of debt financing. The optimal capital structure is usually involve some debt, but not cent percent debt. Generally, some firms cannot identify this optimal point precisely, but they should attempt to find an optimum range for capital structure.

Literature Review

Rao (2001) made an attempt to explain the variation of capital structure across industries in India during pre and post liberalization regime and also examine if there is any significant change in average industry level capital structure during post liberalization regime. The study is based on industry wise data of 85 industries in manufacturing sector the results shows that there has been significant decrease in leverage during post liberalization regime and there has been change in set of explanatory variables for capital structure. The most significant explanatory

variables for capital structure during pre liberalization regime were the measure of profitability, risk and asset type. During post liberalization regime measure of profitability, growth and asset type were the most significant variables.

Bhaduri (2002) studied the capital structure choice in developing countries through a case study of Indian corporate sector, for the period 1989-90 to 1994-95, based on a sample of 363 firms across nine industries. The author has reported optimal capital structure choice is influenced by factors such as growth, cash flow size and product industry and characteristics.

Gupta (2004) conducted a study of a sample of 210 companies reporting the seventeen industrial sector in India for 1992-2000 period by using ANOVA and multiple linear regression model. The study found significant variation in debt-equity ratio in industrial sector. The cement sector showed the highest debt equity ratio. The size of the firm was not found to be significant for leverage tax shield and depreciation was found to be positive correlated between debt equity ratio and flexibility.

Bhayani (2005) examined the capital structure of Indian private corporate sectors. The investigation has been performed using panel data procedure for a sample of 504 Indian companies listed on any stock exchange from 1995 to 2003-04. the hypothesis that has been tested was that the debt –equity ratio depends upon asset structure , size ROA and debt ratio. Multivariate regression analysis was used to find out the significant factors for determinants of capital structure. He conclude that the firms that maintains large proportion of fixed assets tends to maintain a higher debt ratio then smaller firms. Further more large firms employ more debt capital with comparison to smaller firms and firms with high profitability ratio tends to use less debts then firms do not generates high profit. His findings also suggest that the firms do follow a target capital structure during the examination period, these results are consistent with theoretical backgrounds.

Madan (2007) examine the role of financing decision in the overall performance of the companies. It aims to analyze the debt equity structure of hotels and try to discover the industry benchmark and scrutinize how capital structure play a role in the overall growth of a company .

this paper is based on financial data collected on leading hotel chain in India. His findings was the firms that have been moderately geared are able to generate good return on equity.

Sinha and Ghosh (2008) test the modern capital structure theories view static relationship of leverage with specific characteristics and purpose of unique singes and magnitude for the coefficient of the firm's specific determinants. Apart from this static view, the dynamic tradeoff theories propose for change in both the singes and magnitude of the coefficients. The present study examines whether the nature of determinants of capital structure decision of Indian firms is dynamic or not. The study concludes that the determinants of corporate capital structure change there sine and magnitude with resects to orders of determinants, the time periods, and the capital structure components. The study revels that the firm's size, profitability, growth rate and tangibility are the most prominent determinants of a firm's capital structure. Capital structure change is dynamic in nature and the static theoretical explanation is not a persisting behaviour.

Xu (2009) made an attempt to study the impact of marketing timing on Canadian firms' capital structure and make a comparision with US firms. The results obtained by the author showed no evidence of market timing on capital structure of Canadian firms like US firms. The effect of past issue on Canadian firms' capital structure is transitory and the speed of adjustment of Canadian firms are more then US firms.

Empirical Frame work:

An empirical framework has been constructed to examin the relationship between leverage ratio and various determinants of capital structure in the context of BSE Sensex. This section is divided in to three subsections such as model specification, methodology and measurement of leverage ratio and determinants of capital structure.

Objective and Hypothesis of the study:

1. To see the effect of growth on leverage ratio.
2. To look the influence of asset structure on leverage ratio.

3. To determine whether profitability has its impact on leverage ratio.
4. To look into the effect on debt service ratio on leverage ratio.
5. To determine whether agency cost has its effect on leverage ratio.
6. To examine whether size has its impact on leverage ratio.
7. To see whether business risk has its impact on leverage ratio.
8. To examine whether tangibility has its effect on leverage ratio.
9. To look the influence of bankruptcy on leverage ratio.
10. To examine whether non-debt tax has its impact on leverage ratio.

Hypothesis:

1. Leverage ratio is positively related influenced by growth.
2. Leverage ratio is positively related influenced by asset structure.
3. Leverage ratio is negatively related influenced by profitability.
4. Leverage ratio is positively related influenced by debt service ratio.
5. Leverage ratio is negatively related influenced by agency cost.
6. Leverage ratio is positively related influenced by size.
7. Leverage ratio is negatively related influenced by business risk.
8. Leverage ratio is positively related influenced by tangibility.
9. Leverage ratio is positively related influenced by bankruptcy cost.
10. Leverage ratio is negatively related influenced by non-debt-tax.

Research Methodology:

Multiple regression model has been applied to study the impact of various variables on dependent variables i.e., leverage ratio.

In order to test the individual regression coefficient of the regression equation t- test is applied to observe whether the independent variables has been instrumental to define the dependent variable i.e. leverage ratio. In place of actual values of dependent and independent variables, logarithmic value has been considered.

The Multiple Regression Model:

Pooled cross- sectioned time series regression model is used to analyzed the capital structure determinants

$$Lev = A_1 + x_1 \times G_r + x_2 \times A_s + x_3 \times P_r + x_4 \times D_s + x_5 \times A_c + x_6 \times S_z + x_7 \times R_i + x_8 \times U_n + x_9 \times B_k + x_{10} \times T_s$$

Where ,

Lev = Leverage ratio , which is linearly dependent upon

1. Gr = Growth
2. As = Asset structure
3. Pr = Profitability
4. Ds = Debt Service
5. Ac = Agency Cost
6. Sz = Size of the company
7. Ri = Business Risk
8. Un = Uniqueness
9. Bk = Bankruptcy
10. Ts = Tax- Shield

Dependent variable

Doukas and Pantzalis (2003) defined capital structure as a long debt scaled by total debt + market value of equity. So by the following formula we can determine leverage ratio.

$$Levergr \ Ratio = \frac{Long \ Term \ Debt}{(Long \ Term \ Debt + Market \ Value \ of \ Equity)}$$

Independent variables:

Growth (Gr)

Under investment and asset substitution problems that debt is supported by assets-in-place rather than growth opportunity, Myers and Maglect (1984).

$$G_r = \left[\frac{(Total\ Assets)_n}{(Total\ Assets)_n} \right]^{1/n}$$

Asset Structure (As)

Asset Structure is calculated as ratio of fixed asset to total assets.

$$\text{Asset Structure} = \text{Fixed Assets} / \text{Total Assets}$$

Profitability (Pr)

Profitability can be calculated as

$$\text{PBT} / \text{Total Assets}$$

PBT = Profitability before Tax,

Total Assets = Fixed Assets + Current Assets

Debt Service capacity (Ds)

A high ratio is desirable, but a too high ratio indicates that the firm is very conservative in using debt debt, and is not using credit to the best advantage of share holders. A lower ratio indicates excessive use of debt.

Debt Service capacity = Total Interest Paid/ EBIT

Agency Cost (Ac)

Higher agency cost is expected to result in lower debt levels , Doukas and Pantzalis (2003). It can be considered as

$$\text{Agency Cost} = [\text{Total Asset (t)} - \text{Total Assets (t-1)}] / \text{Total Assests}$$

Size of the company (Sz)

Rajan and Zingales (1995) argues that large firms tends to disclose more information to outside investors than the smaller ones overall , large firms with less asymmetric information problems should tend to have more equity than debt and thus , have lower leverage. However, large firms are often more diversified and have more stable cash flow.

However, for the purpose of collecting the data **Natural Log of Total Asset** has been taken into consideration.

Business Risk (Ri)

Business risk is the risk associated with the future operations of the business. This is the risk that is inherent in the expected net operating income stream generated by the assets of the firm (Bishop, Fagg Oliver and Twite.2004)

Business Risk = Standard Deviation of EBIT

EBIT = Earning Before Interest and Taxes.

Uniqueness (Un)

Loof (2003) summarizes the idea due to Titman (1984), that the more unique a firm's asset is, the thinner the market for such assets. Accordingly the lower is the expected value recoverable by a lender in the event of bankruptcy. Hence, we may expect that uniqueness be negatively related to leverage. Following Titman and Wessels (1988), uniqueness is measured as the ratio of expenditures on research and development over sales.

$$\text{Uniqueness} = \text{Expenditure on Research and development} / \text{Total sales}$$

Bankruptcy Ratio (Br)

Higher level of debt will increases the probability of bankruptcy , Eitemen, Stonehill and Moffett (2001).

It is calculated as

Bankruptcy Ratio = S.D.of first difference in PBIT/ Total Interest Expenses

Non – Debt Tax Shield (Dnt)

The Indicator for Non- Debt Tax shield can be considered as

$$\text{No Tax Shield} = \frac{\frac{EBIT - i - t}{0.4}}{\text{Total Assets}}$$

Where,

t = Tax payments

EBDIT = operating Income

i = Interest payments

0.4 Assumed tax rate

Analysis:

Table 1: Descriptive Analysis

	Minimum	Maximum	Mean	Std. Deviation	Variance	Skewnes s	Kurtosis
Size	1.819698837 92	8.26673753714	5.3096292933 496	1.320527076 81320	1.744	-.225	.228
Profitability	-.020	.263	.13341	.064090	.004	-.136	-.018
Assets Structure	-.488	.824	.32797	.261220	.068	-.744	1.101
Business Risk	.36	307.04	46.0949	72.80409	5300.436	2.652	6.463
Debt Service	-.202	1.646	.54561	.328424	.108	.651	1.877
Agency Cost	.0000000000 0	2.80419258859	1.0745273106 266	.5714360063 5051	.327	1.046	1.843
Bankruptcy Ratio	.5319148936 17	26.34615384615 4	2.8593293825 4503	4.447917823 617035	19.784	4.075	18.947
Growth	-533.507	.604	-16.73692	82.241104	6763.599	-6.111	38.583
Tax Shield	.008400	83.191584	9.01184836	13.69071007 9	187.436	3.991	20.159

Uniqueness	-	.303803931580	.08228398169	.0547419705	.003	1.939	6.245
	.0031249500		159	02336			
Debt Equity Ratio	91						
	-9.88	12.10	2.0928	3.77960	14.285	-306	3.255

Table -2: Model Summary^p

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. Change	
1	.718 ^a	.516	.364	3.01328	.516	3.408	10	32	.004	2.080

Table 3 : ANOVA^p

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	309.432	10	30.943	3.408	.004 ^a
	Residual	290.555	32	9.080		
	Total	599.987	42			

Table 4 : Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	-2.524	4.614		-.547	.588	-11.923	6.876		
	Size	.377	.786	.133	.479	.635	-1.225	1.978	.196	5.103
	Profitability	8.204	15.652	.136	.524	.604	-23.678	40.087	.224	4.472
	Assets Structure	-4.126	2.429	-.284	-1.699	.099*	-9.074	.822	.543	1.843
	Business Risk	-.015	.013	-.302	-1.214	.233	-.041	.010	.246	4.073
	Debt Service	4.367	2.540	.377	1.719	.095*	-.807	9.542	.314	3.181
	Agency Cost	-1.285	1.535	-.196	-.837	.409	-4.412	1.843	.275	3.633

Bankruptcy Ratio	.065	.159	.077	.406	.688	-.260	.390	.421	2.378
Growth	.038	.011	.834	3.312	.002*	.015	.061	.239	4.187
Tax Shield	.279	.095	1.021	2.944	.006*	.086	.473	.126	7.947
Uniqueness	6.042	10.729	.089	.563	.577	-15.813	27.896	.612	1.634

a. Dependent Variable: Debt Equity Ratio

b. * shows determinants found to be significant

Empirical Analysis

The model incorporates 71.8 % (From Table -2 , value of R-Square) variations in Debt equity ratio (leverage) thus the model has good explanatory power.

The ANOVA result shows that the majority of the error is being addressed by the regression model established in the study.

The model: (From Table – 4)

$$Lev = -2.524 + .34 \times G_r + 4.13 \times A_s + 8.2 \times P_r + 4.37 \times D_s + 1.3 \times A_c + .377 \times S_z + 1.5 \times R_i + 6.04 \times U_n + .7 \times B_k$$

From the sample of 44 listed companies of sugar industry, the relationship between leverage as dependant variable and 10 independent variables has turned out as follows

Leverage ratio will increase with increase in size, profitability, debt service, bankruptcy ratio, growth, tax- shield and uniqueness of the firm. Thus a firm thinking to enhance any of these determinants (independent variable) must be ready to take a shot in the leverage of the company. However the leverage ratio has shown negative impact of increase in asset structure, business risk, and agency cost. Thus if company is concerned about increasing leverage ratio it can pull up these three variables (A_s, R_i, A_c) to cap Leverage.

However 4 independent variable out of 10, have significant relationship (at 10 % level of significance).

Thus on the basis of our sample study we can state with 90% confidence that asset structure (A_s) has negative relationship with leverage and debt service capacity (D_s), growth of the company (G_r) and tax-shield(T_s) have positive relationship with leverage.

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