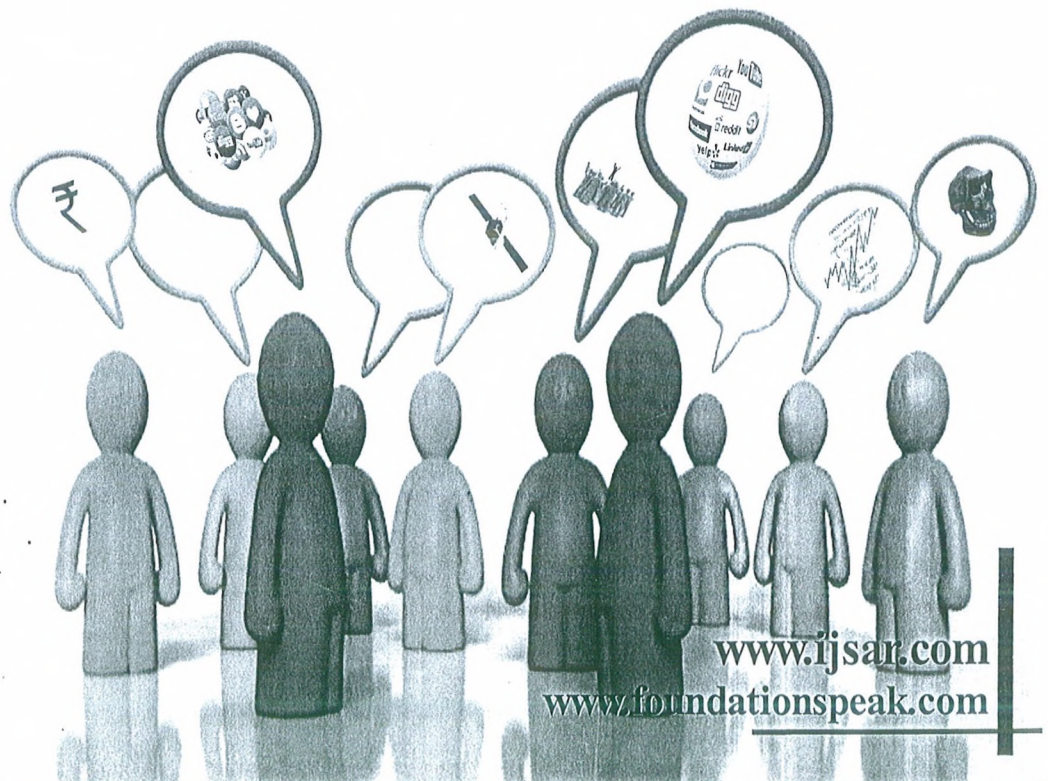




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DETERMINANTS OF CAPITAL STRUCTURE – EVIDENCE FROM INDIAN STEEL COMPANIES

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Abstract

The steel sector is one of the sectors playing most crucial role in the development of a nation and is considered as the backbone of civilization. The Indian steel industry has entered a new development stage since 2007-2008 and is riding on the resurgent economy and the growing demand for steel. India's 33 percent growth in steel production in the last five years was second only to China among the top five steel producing nations (World Steel Association - WSA). The research study focuses on evaluating the determinants and the combination of capital structure of selected steel companies in India for a period of 10 years from 2004-2005 to 2013-2014 to find out the optimum capital structure to maximize profits in the steel industry in India. The correlation analysis and multiple regression analysis methods were adopted to carry out the study.

Keywords: Capital structure, Debt to capital, Return on assets, Return on equity, Earnings per share, Asset growth.

1. INTRODUCTION

"The capital structure decision can affect the value of the firm either by changing the expected earnings or the cost of capital or both."

A company's capitalization describes the composition of a company's permanent or long-term capital, consisting of a blend of debt and equity. An appropriate proportion of equity and debt funds, in the capital structure of a company, are a sign of financial fitness. In a company's capital structure, equity consists of a company's common stock plus retained earnings, are shown in the shareholders' equity account on a balance sheet.

The company's long-term investment in capital and debt, forms a company's capital structure, i.e. a permanent type of backing to support a company's progress, resources and functioning. The best debt-to-equity ratio for a firm is that which maximizes its value.

Capital structure is most often referred to as a firm's debt-equity ratio, which provides understanding for potential investors about the nature of risk associated with the company.

The optimal capital structure for a company is one which offers a balance between the ideal debt-to-

equity ranges and minimizes the firm's cost of capital. However, the debt financing generally offers lowest cost of capital due to its tax deductibility. But, it is rarely the optimal structure since a company's risk generally increases as debt increases.

1.1. Steel Industry - An Overview

Being a core sector, steel industry even though tracks the overall economic growth in the long term. Its demand is derived from other sectors like automobiles, consumer durables, textiles and infrastructure and its prosperity is depended on the growth of these user industries.

The Indian steel industry has its advantage of local availability of raw materials and cheap human resource. The iron ore is also available in ample quantities providing a major cost benefit to the domestic steel industry.

Global crude steel production reached 1414 million tonnes in the calendar year 2010, a growth of 15 percent over 2009. The Indian Steel industry was delicensed and decontrolled during the year 1991 and 1992 correspondingly. Currently, India is the fourth largest crude steel producer of steel in the world. Last five year's production for sale of pig iron, sponge iron and total finished steel (alloy + non-alloy) are given in Table 1.

Table 1: Production of Iron and Steel in India

Indian steel industry : Production for Sale (in million tonnes)					
Category	2009-10	2010-11	2011-12	2012-13	2013-14
Pig Iron	5.88	5.68	5.371	6.870	7.950
Sponge Iron	24.33	25.08	19.63	14.33	18.20
Total Finished Steel (alloy + non alloy)	60.62	68.62	75.70	81.68	87.67

Source: Joint Plant Committee Report

Table 1 shows the quantity of production of iron and steel in India from the year 2009-10 to 2013-14 respectively. India is the largest producer of sponge iron in the world with the coal based route accounting for 88% of total sponge iron production in the country. The current study focuses to examine the components of the capital structure of selected steel companies in India, to study the impact of capital structure on profitability and growth of the selected companies and to determine the factors influencing the capital structure of the selected companies.

1.2. Objectives of The Study

The main purpose of research study is to find out the determinants of capital structure of the selected steel companies in India during the years 2004-05 to 2013-14. The study will examine the components of the capital structure of selected steel companies, reveal the impact of capital structure on profitability and growth of the selected steel companies and will determine the factors influencing the capital structure of the selected companies.

2. LITERATURE REVIEW

Earlier studies were gone through to identify a clear picture of capital structure, its components and impact on various aspects of a firm. Some of them were discussed below:

Modigliani and Miller (1958)⁽¹³⁾ in their study titled, "The cost of capital, corporation finance, and the theory of investment" illustrated that in circumstances where corporate income taxes and distress costs are not present in the business situation, using of financial leverage will not effect on the value of the company. This scenario, identified as the Irrelevance Proposition theorem. Later on they had expanded their Irrelevance Proposition theorem to include the impact of corporate income taxes, and the probable

impact of distress cost, for the sake of determining the optimum capital structure for a company.

According to the Trade-off Theory of capital structure, a company's optimal capital structure should be the prudent balance between the tax benefits that are associated with the use of debt capital, and the costs accompanied with the potential for insolvency of the company. Now, the principle of the Trade-off Theory is the foundation that corporate management should be using to determine the optimal capital structure for a company.

The second theory used to conceptualize capital structure is the Pecking Order Theory, where the firms prefer to finance themselves internally through retained earnings; when this source of financing is not available, then the company issues debt and only at last instance does it issues equity.

The Pecking Order Theory is popularized by Myers (1984), where he discusses that equity is preferred less to raise capital as such when managers issue new equity, investors trust that managers think the firm is overvalued and managers take the advantage of this over-valuation. Hence, the investors will place a lower value to the new equity issuance. Hence, the trade-off theory considerations help firms determine their debt capacity, and the pecking order theory defines firms' preferences among different methods of financing.

Chen et al (1998)⁽²⁾ identified the relevance of pecking order hypothesis in explaining the financing choice of Dutch firms, showing the importance of asymmetric information models in explaining capital structure choice of Dutch firms.

Bauer (2004)⁽¹¹⁾ found Czech firms showing relatively low leverage measured in book value, but high leverage assessed in market value. It was suggested that firms with higher future growth opportunities should use more equity financing. Most of the determinants of capital structure suggested by capital structure theories appeared to be relevant for Swedish firms but there were significant differences in the determinants of long and short-term forms of debt illustrated Song (2005)⁽¹⁸⁾. An increase in financial leverage was negatively correlated with firm value and the impact of interest rates on capital structure was proved to be inconclusive by Rayan (2008)⁽¹⁶⁾.

The capital structure (Total Borrowing to Total Assets) of the profit making PSUs is affected by Asset Structure (Net Fixed Assets to Total Assets, NFATA), Profitability (Return on Assets, ROA) and Tax was suggested by Mishra (2011)⁽¹²⁾. Goyal (2013)⁽⁴⁾ revealed the positive relationship of short term debt with profitability as measured by ROE, ROA and EPS. Leon (2013)⁽¹¹⁾ had revealed a

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significant negative relationship between leverage and return on equity and there was no significance relationship between leverage and return on assets.

Sovbetov (2013)⁽¹⁹⁾ had observed that the gearing has a strong and negative impact on profitability, so on market value of equity. There was significant negative relationship between the profitability and the capital structure which means that the pharmaceutical companies have established a Pecking Order Theory and the internal financing has led to more profitability was revealed by Mohammadzadeh et al (2013)⁽¹⁴⁾.

Chisti et al (2013)⁽³⁾ shown a significant impact of capital structure on the profitability of selected Indian firms on debt to assets ratio and interest coverage ratio. Handoo and Sharma (2014)⁽⁵⁾ identified that factors such as profitability, growth, asset tangibility, size, cost of debt, tax rate and debt serving capacity have significant impact on the leverage structure chosen by firms in the Indian context.

Other Literature sources include <http://www.businessdirectory.com>⁽⁷⁾, Pandey (2010)⁽¹⁵⁾ and Sharma and Gupta (2010)⁽¹⁷⁾.

3. RESEARCH METHODOLOGY

The research study was completely based on the secondary data which has been collected from various websites and audited annual financial reports of the selected companies belonging to the Steel Industry of India. The period of study was from the year 2004–05 to 2013–14. The purposive sampling technique was adopted for the selection of sample companies.

The criteria for selection of sample companies are, (a) the companies should be listed in BSE, (b) there should be continuous availability of data for ten financial years and (c) the annual net profit for the year ending March 2014 should be more than ₹10 crores.

The companies considered for sample are (i) Tata Steel Limited⁽⁹⁾, (ii) Steel Authority of India Limited⁽⁸⁾ and (iii) Bajaj Steel Industries Ltd⁽⁶⁾. The average mean, standard deviation, variance, correlation analysis and multiple regression analysis were used to analyze the capital structure of the selected companies.

3.1. Limitations of The Study

The limitations of the current study are:

- The sample of the study is confined to ten financial years of the selected steel companies only.
- The study was based on the secondary data collected from published annual reports and no primary data is used for analysis.

4. RESULTS, ANALYSIS AND DISCUSSION

4.1. Components of The Capital Structure of Selected Steel Companies

The independent variables selected for the analysis are (SDTC) Short term debt to capital, (LDTC) Long term debt to capital, (TDTC) Total debt to capital and the dependent variables selected are (ROA) Return on assets, (ROE) Return on Equity and (EPS) Earnings per Share and the control variables are (FMS) Firm Size, and (AG) Asset growth. The descriptive statistics of the study are shown in the Table 2.

Table 2: Descriptive Statistics

	N	Range	Mean	S.D	Variance
LTDC	30	1.14	0.446	0.27	0.07
STDC	30	1.17	0.28	0.22	0.05
TDTC	30	2.04	0.74	0.49	0.24
ROA	30	3.50	1.67	1.17	1.38
ROE	30	140.0	57.97	50.29	2529.85
EPS	30	70.79	34.99	25.89	670.43
FMS	30	7.87	8.46	3.07	9.48
AG	30	82971.89	30080.58	28511.93	812930425.8

SDTC- Short term debt to capital, LDTC- Long term debt to capital, TDTC- Total debt to capital, ROA- Return on assets, ROE- Return on Equity, FMS- Firm Size, AG- Asset growth, N- Ten years data of three companies.

Source: Published Reports of Selected Companies

The Table 2 shows the Average Mean, Standard Deviation and Variance of independent (LTDC, STDC and TDC) dependent (ROA, ROE and EPS) and control variables (AG and SIZE) of the selected companies throughout the period of study. The profitability measured by return on equity (ROE) reveals an average of 57.97 percent with standard deviation of 50.29 percent showing a satisfactory performance during the study period. The ROE measures the contribution of net income available for the companies' shareholders and it is a measure of the efficiency of the owners' invested capital. The STDC variable measures the ratio of short term debt to total capital. The average value of this variable is 0.28 with SD of 0.22. The variable TDTC measures the ratio of total debt to total capital. The average value of this variable is 0.74 with SD of 0.49. The earnings per share show high return for the Shareholders throughout the study period.

4.2. Impact of Capital Structure Variables on Profitability and Growth using Correlation Analysis

Correlation analysis was done in order to find out the relationship between the variables and the dependence of the variables selected for the study. Table 3 shows 5 results of correlation analysis of the variables.

Table 3: Correlation Analysis

		LTDC	STDC	TDTC	ROA	ROE	EPS	FMS	AG
LTDC	Pearson Correlation	1	.409*	.930**	.569**	-.135	-.064	-.616**	-.312
	Sig. (2-tailed)		.025	.000	.001	.477	.735	.000	.094
STDC	Pearson Correlation	.409*	1	.396*	.183	.253	-.030	-.190	-.202
	Sig. (2-tailed)	.025		.030	.332	.178	.876	.315	.283
TDTC	Pearson Correlation	.930**	.396*	1	.737**	-.280	-.220	-.772**	-.507**
	Sig. (2-tailed)	.000	.030		.000	.135	.243	.000	.004
ROA	Pearson Correlation	.569**	.183	.737**	1	-.575**	-.341	-.944**	-.866**
	Sig. (2-tailed)	.001	.332	.000		.001	.065	.000	.000
ROE	Pearson Correlation	-.135	.253	-.280	-.575**	1	.779**	.475**	.401*
	Sig. (2-tailed)	.477	.178	.135	.001		.000	.008	.028
EPS	Pearson Correlation	-.064	-.030	-.220	-.341	.779**	1	.224	.286
	Sig. (2-tailed)	.735	.876	.243	.065	.000		.235	.126
FMS	Pearson Correlation	-.616**	-.190	-.772**	-.944**	.475**	.224	1	.854**
	Sig. (2-tailed)	.000	.315	.000	.000	.008	.235		.000
AG	Pearson Correlation	-.312	-.202	-.507**	-.866**	.401*	.286	.854**	1
	Sig. (2-tailed)	.094	.283	.004	.000	.028	.126	.000	

Source: Published Reports of Selected Companies

Table 4: Coefficient of Dependent Variables

Model	R	R Square	Adjusted R Square	Standard Error of the Estimate	R Square Change
1(ROA)	.806 ^a	.649	.609	.73620	0.649
2(ROE)	.567 ^b	.322	.243	43.75250	0.232

Source: Published Reports.

Table 5: Dependent and Independent Variables' Association

Model Summary	Standardized Coefficients Beta	T(ROA)	Standardized Coefficients Beta	T(ROE)	Standardized Coefficients Beta	T(EPS)
(Constant)		5.622		-.389		1.871
LTDC	-.069	-.361	.539	1.052	.984	1.726
STDC	-.052	-.729	.338	1.767	.103	.483
TDTC	.248	1.088	-.571	-.938	-1.432	-2.114
FMS	-.538	-2.822	.494	.971	-.588	-1.038
AG	-.313	-2.153	-.074	-.192	.389	.901

Source: Published Reports

The Table 3 represents the correlation matrix, revealing the relationship among variables in the study. Correlation shows the dependence of one variable on other variable. The crosswise elements are the correlations of the variables with themselves are always equal to one.

LTDC has been highly correlated with STDC (0.409), TDTC (0.930), ROA (0.569) which indicates that if one variable increases, other variables also increases for example if long term debt capital increases, variables like Short term debt capital, total debt to

capital and return on assets increases in this study and negatively correlated with the rest of the variables.

While ROA correlated with STDC (0.569), LTDC (0.183) & TDTC (0.737), EPS is moderately correlated with ROE (0.779), FMS (0.224) and AG (0.286).

FIRM SIZE has been highly correlated with AG (0.854), ROE (0.475) and moderately correlates with EPS (0.235). AG has been highly correlated with FIRM SIZE (0.854), ROE (0.286) and EPS (0.401).

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4.3. Determining Factors Influencing Capital Structure using Multiple Regression Analysis

The multiple regression analysis is used to examine the relationship between capital structure, profitability and growth of the selected companies. It also reveals the factors influencing the capital structure of the selected companies. The following Table 4 and 5 exhibit the multiple regression results.

From Table 4, regression analysis shows that R Square, the coefficient of determination, which is the squared value of the multiple correlation coefficients is about 64% of Model 1 (based on ROA) and 32% of Model 2 (based on ROE) has been explained by the dependent variables.

From Table 5 the results in Regression (1) ROA denotes a positive relationship between total debt and ROA. Regression (2) ROE shows a significantly positive association between ROE & long term debt as well as Short term debt to capital. This implies that an increase in the short debt and long-term debt position is associated with increase in profitability. This is explained by the fact that debts are relatively less expensive than equity, and therefore high proportions of them could lead to higher profitability. The results from regression (3) EPS indicate also a significantly positive association between long term debt, short term debt and asset growth as measured by EPS.

It also denotes a negative regression coefficient for total debt with ROE & EPS implying an increase in the debt position is associated with a decrease in profitability and a decrease in debt results in increase of the profitability for the selected steel firms. This suggests that profitable Indian steel firms depend more on debt as their main financing option than equity.

5. CONCLUSION

Domestic steel makers, who are facing subdued off take, have something to cheer about now. The premier global industry association has projected India's steel demand to grow at 3.4 percent during the year 2014.⁽¹⁰⁾ In 2015, structural reforms and improving confidence will support a further six percent growth in steel demand but elevated inflation and fiscal consolidation remain key downside risks to the outlook. The study indicates that short term debt as well as long term debt has been essential for determining the profitability of the selected Indian steel companies. They are showing a positive relationship with Earning per share and Return on Equity.

Total debt shows positive relationship with Return on Assets but negative association with the other two

variables, i.e. ROE and EPS. Asset Growth shows positive association with EPS and Firm Size shows Positive relationship with ROE. Thus from the study, it can be concluded that Short term debt as well as long term debt has been associated with the profitability and were found to be the major determinants of the selected steel companies in India. It is suggested to choose more of Short term debt and long term debt for financing capital structure to achieve optimum capital structure in the scenario of Indian Steel Industry. Profitability and Growth of steel industry is essential to the industrial development of India. The steel industry contributes significantly to the economic development of India.

5.1. Scope for Further Research

More steel companies can be studied covering more financial years to get a wider knowledge about the capital structure and its impact on various aspects of the companies in long run. New models can be framed and other statistical and financial tools can be adopted to find a precise financial status of the companies. Both Indian and foreign steel companies can be studied comparatively to suggest ideas for their improvement.

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