Capital Structure of Indian Steel Companies: Its Determinants

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Abstract

This paper is an attempt to study the capital structure of Indian Steel Industry and its determinants. The 66 sample steel companies are bearing an average debt portion of 68% in their capital structure means highly debt driven. Hence we tried to figure out which are the factors significantly explaining the capital structure. For which we have considered eight independent variables from early studies and employed correlation analysis, multiple regression and stepwise regression techniques in this study to test the dependency of the debt ratio on independent variables. We found only three variables such as profitability, growth and risk having significant impact on the debt ratio of these steel companies and following the trend of tradeoff theory.

Keywords: Capital Structure, Debt ratio, Steel sector, Trade off theory, Pecking order theory, Profitability, Growth, Risk.

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1.0 Introduction

Capital structure theory can be said as the manner in which a company or organization finance its economic activities. Basically capital structure of a firm is the combination of equity and debt. It is a very important decision for every organization or business house. This decision revolves around a question “How to make an optimal capital structure for the firm?” and what are the factors that influence the decision. Because the capital structure decision ultimately affect the management, investors and lenders. So it becomes very crucial for the firms. Earlier many researchers have made investigation on the capital structure determinants but still there are loopholes to be filled up. The theory of Capital Structure began with the phenomenal work made

by Modigliani and Miller (1958, 1963). It stirred the academic world to pour more thoughts into that and many interesting work came out. This gave birth to many theories such as Trade-off theory (Ogden et al 2003), Pecking order theory (Myers 2003, Myers and Majluf 1984) and Market timing theory (Graham and Harvey, 2001). Many numbers of empirical works have been done on these theories.

Trade-off theory can be referred as a balancing act between the cost of debt and benefits of debt to determine the capital structure. Almost every organization has two sides of finance one is equity and other one is the debt. The advantage of financing with debt is that debt provides a tax benefit. Also financing with debt the firm needs to bear the cost. The cost and the benefits of the debt differ from organization to organization. From the "agency" prospective debt disciplines managers and reduce the rift between the managers and shareholders. So debt financing is highly required in every organization. But for a high risky firm i.e. where the intangible assets are more, debt financing is also risky. In that situation equity is the better option. But equity financing is also having its own disadvantages. In other way, for a manufacturing firm where tangible assets are more, in that case debt financing is a very good option and also cheaper for the firm. So the firm needs to strike a proper balance between these two options.

Pecking order theory, which is another important theory having deep root in literature. This theory primarily focuses on the prioritization of the sources of fund in the capital structure. There are three sources of finance available for firm namely retained earnings, outsider's fund and equity. This theory basically based upon asymmetric information. Asymmetric information affects the choice between the internal fund and external fund. Firms, while financing their future projects always prefer to use their retained earnings first, because internal financing does not require any public disclosure of information and do not have any fixed cost. If the company does

not have any retained earnings then the company prefers to use external fund because external funds are cheaper and less risky. Lastly the firms will think about the raising of equity for financing.

Another theory which has taken a centre stage now days is the Market timing theory. This theory deals with the basic idea about the current market conditions in both the debt and equity market. Every firm needs the mix of debt and equity to finance its business activities and at the same time the firms wants the cost of finance to be cheaper. So the timing of raising fund is very crucial, if the timing is perfect then the cost will be cheaper. At the time of requirement of fund, the firms need to make a comparison between the equity market and debt market. Whichever market looks favorable the firm needs to raise the fund from that market. In other way round, it can be said that if current conditions are favorable, then the firm should raise funds for future use. Due to this theory, the focus has been shifted to equity market and debt market conditions to design an optimal capital structure.

1.1 Indian Steel Sector

Since the industrialization happened in India, the country has become one of the fastest growing economies in the world. Sectors like construction, housing, transportation, power generation has grown rampantly with the growth of Indian economy. This led to increase in the demand for iron and steel in the country and India has emerged as the fourth largest producer of crude steel in the world in 2010 and expected to become the second largest producer by 2015. Although China is the dominant player in the global steel sector, India is also increasing its presence in the globe due to its strong domestic steel consumption. India’s finished steel consumption has grown with a compound annual growth rate of 9.4% in between 2004-2010 as per the World Steel

Association (WSA). The per capita consumption of the steel usage in India is still low as comparison to world consumption and expected to grow in a significant manner in the coming years. At the same time, India is also a mineral rich country where vast storage of iron ore is present and many Indian and foreign companies want to enter into this sector to encash it. The new mining bill of Indian government will further boost the mine development and investment in the country. At present there are 418 private and public steel companies operating in India and these companies are witnessing a slow demand due to the global financial crisis since 2007 but the long term growth story will remain intact. If proper funding and attention will be given to this sector then India can be the largest exporter of iron and steel. Hence this sector needs a special focus for its growth and sustainability.

For the growth and sustainability of any company or sector fundamentally huge fund or capital is required. Then the question arises from where the fund will come? As per Pecking Order Theory (Myers and Majluf, 1984) fund can be generated from three sources such as retained earnings, equity from the market and debt or loan. No doubt there are three sources available but at what proportion the company should raise equity and debt from the market. Because there should be a proper balance required between the debt and equity mix and what are the factors that influence the capital structure decision are crucial question. In present scenario, the global economy is under tremendous pressure, manufacturing output is not giving a sign of growth and a stale demand is prevailing in the market. Hence at this movement, the steel companies have to rework on their debt-equity mix to reduce the cost. Currently this paper is devoted to Indian steel sector and finding out their capital structure issues and the factors influencing their capital structure decision.

2.0 Literature Survey

Earlier many studies were done on various angles of the capital structure but till now any unifying theory has not come. Most of the literature has focused primarily on the way or manner through which the firms have financed their assets. Every firm has two aspects of finance, one is equity and other one is debt. Many researchers have the opinion that debt financing is the best and cheapest option for financing the projects. Much research work has been done on the relationship between the capital structure and firm value and role of debt financing in the capital structure theories, whereas some researchers like Titman and Wessels (1988), Harris and Raviv (1991) have focused on the determinants of the capital structure of the firm.

However the new age capital structure theory started with the pioneer work of the Modigliani and Miller (1958). Their illustrative work was published almost five decades ago and popularly known as a Modigliani-Miller Theory. This theory explains that the value of the firm is unaffected by the capital structure of the firm under certain conditions. That means debt-equity mix of the firm has no bearings on the market value of the firm. Since then a serious debate has aroused on the viability of this theory and with the changing times this theory seemed lost relevance and many scholars and researchers also criticized the theory from various grounds like assuming high bankruptcy cost. Angelo and Masulis (1978) argued that Modigliani and Miller theory had not considered the tax savings of debt and its sensitivity in their study. However Modigliani and Miller (1963, 1977) in their later studies considered the effect of debt tax shield and concluded that tax shield has an impact on firm value.

In capital structure theory, there are two basic schools of thought, one is Trade-off theory and the other one is Pecking Order theory. Trade-off theory was coined by Kraus and Litzebnerger in the

year 1973. This theory mainly argues that a firm's optimal debt ratio can be determined by making a tradeoff between the benefit and costs of debt. Firms can alter debt for equity or equity for debt in order to maximize the firm value. Same way Myers (1984) considered a contest between the debt tax shield and bankruptcy cost to decide a proper debt-equity mix.

Further "agency cost" was taken into consideration for designing an optimal capital structure in Agency Theory (Jensen & Meckling 1976). The existence of agency cost happens due to the asymmetric information. Same way if the lenders have not sufficient information then there is tendency that the interest rate will go up (Robichek & Myers, 1966; Baumal & Malkiel, 1967; Baxter, 1967; Bierman & Thomas, 1972; Rubinstein, 1973; Stiglitz, 1972). More or less in every organization the agency problem exists but debt minimizes the rift between the managers and shareholders. The managers act properly when debt is injected in the capital structure while most of the time they are reluctant to raise debt but at the time of acquisition threat, they give preference to debt (Stulz, 1990). Myers and Majluf (1984) explained the order of finance to be done for a new project is popularly known as "Pecking Order Theory". This theory is having lot of implications in the capital structure theory. Myers (1984) in his study favored retained earnings over debt and debt over equity and this was motivated by the Myers and Majluf's (1984) adverse selection model.

Titman and Wessels (1988) inferred that firms which are having unique product are having lower debt. Further they found that debt ratio was positively affected by the non-debt tax shield, expected growth, non-current assets and size of the firm where as profitability, advertisement expenditure, research and development expenditures affected negatively.

In Indian context, very few studies have been done so far on capital structure theory. Chakraborty (1977) who has made an early study on capital structure where he found that age, profitability and retained earnings have a negative impact while capital intensity and total assets have a positive impact on the capital structure. Kakani (1999), in his study found that non-debt tax shield, capital intensity and profitability play a vital role in determining the capital structure. In another study, Singh and Hamid (1992) observed that Indian firms are more depending upon the outsider's fund than on the internal funds. The reason behind is that Indian capital markets are not enough matured, so the firms are finding it hard to raise funds from the equity market.

3.0 Objective of the Study

After analyzing the previous literature it was found that lack of study has been done on capital structure of emerging sectors and there is a need to work on the emerging sector's capital structure decision and the factors influence the decision. We have made an attempt to study the design of capital structure of steel industry and finding out the various factors that affect their capital structure decision. Hence concisely we have cited the twin objectives for this study that are given below.

(a) To find out the important variables that affect the debt ratio of the steel industry by using multiple and step wise regression method in this context.

(b) To identify the positive or negative relationship between the factors affecting the capital structure and the debt ratio.

4.0 Capital Structure

Debt and equity is the two important source of finance for the firms. Basically capital structure of the firm revolves around the judicious mix of the debt and equity. Upon Debt and equity mix much research has been done and many have designed the capital structure in a very different manner. Titman and Wessels (1988) have used six measures of financial leverage for their study. They took long term debt, short term debt, and convertible debt over book value and market value of the equity. In their theory, they took different types of debt for the study because each and every kind of debt has different implications and at the same time they used book value and market value of the equity for their model. While Kakani (1999) in his study used short term debt, long term debt and total debt as measure of capital structure for the model. Mazur (2007) took total debt to total assets for their study. As previously many researchers depicted the measure of capital structure in a number of ways but in this study we have taken total debt over total assets as the measure of capital structure.

Indian steel industry is nearly a century old affairs, the journey began with Tata steel in the year 1907. Since then this industry is contributing the Indian economy largely. Particularly after the globalization era our steel industry has grown up with the world standard. So for a growing industry having huge potentials, we need huge fund. So from where the funds will come. As pecking order theory, there are three kinds of fund available such as retained earnings, debt and equity. We have considered a sample of 66 steel companies for the study of their capital structure and their funding style. Here debt ratio has been designated as the representative of the capital structure.

Debt Ratio = Total debt / Total Assets

Debt ratio explains about the debt portion used to finance the total assets of the company. We have considered the book value of the long term and short term debt for total debt category and non-current and current assets are considered for the total assets category in our study. When we study the debt ratio of these 66 companies, we found that the average debt ratio is 0.68. Hence we can infer that the debt portion is almost 70% of the total asset financed. From this it can be said that these firms are really depending more upon the debt. The reasons may be many and one main reason is that in India the capital market is not so much efficient like western countries from where the equity can be raised easily. Due to which many firms rely on debt in India.

5.0 Determinants of Capital Structure

In this section, we discuss the variables that affect the steel company's debt ratio. These variables are drawn from the earlier theories and empirical researches. These variables are discussed below.

5.1 Asset Structure

Earlier studies found that the non-current assets played a very crucial role in raising debt from the market. Basically tangible non-current assets give the lenders a collateral value and minimize the risk level. Manufacturing firms like steel companies have particularly more tangible non-current assets in their basket, due to which these firms can afford a high debt ratio in their capital structure. According to Trade-off theory, a positive relation exists between the asset structure and debt ratio of a firm. Asset structure has been calculated by taking net fixed assets and total assets into consideration. Here net fixed asset is derived by deducting depreciation from the fixed assets and total assets represent both the current and non-current assets.

Asset Structure = Net Fixed Assets / Total Assets

5.2 Profitability

As per Trade-off theory, the debt ratio and profitability of the firm has a positive relationship. Titman and Wessels (1988) have used the ratios of operating income over sales and operating income over the total assets as indicators of profitability in their study. While Pecking order theory suggested that profitability and debt finance have negative relationship. Earlier many researchers have also taken the profitability as an important tool while explaining the debt ratio. Thus here also it is considered as an important determinant and two elements such as profit before interest & tax and capital employed are taken into consideration for the calculation of profitability. Capital employed is derived by deducting the current liability from the total assets.

Profitability = PBIT / Capital Employed

5.3 Growth Opportunities

According to Trade-off theory, growth opportunity is having a negative relationship with debt ratio. This theory (Myers 1977) argued that firms, those were having high growth tendencies were also having tendency towards higher level of risk. So growth oriented firms find it difficult and costlier to rely on debt financing. While Pecking Order Theory suggests that firms are having growth opportunities require more debt, so debt is having a positive relationship with the growth opportunity. Here compound average growth rate of annual total sales is used to understand the growth of the sector.

Growth Opportunities = Compound average growth of annual sales.

5.4 Size

Many researchers earlier suggested that debt portion in capital structure increases with the increase in size. Also trade-off theory suggests that size and leverage has a positive relationship. In a diversified large firms where the chances of bankruptcy is less, there debt financing can be a more appropriate option (Titman and Wessels, 1988). However firm's size and debt financing goes by hand in hand. To calculate the size, we have taken the logarithm of total assets and total assets consists both the current and fixed assets.

Size = Natural Logarithm of Total Assets.

5.5 Uniqueness

Uniqueness of the firm can be said as the expenditure on research over sales or selling expenses over sales of the firm. According to trade-off theory, uniqueness is having a negative relationship with the debt financing. Firms that are having specialized products suffer from high liquidation cost, which compels the firm to maintain a low debt ratio (Titman, 1984). Firms, which wants a unique product needs to spend more on research and development and again to advertise the product the firm needs to spend more on selling and promotion cost. So R&D expenditure and selling expenditure represent the uniqueness of the firm.

Uniqueness = Selling expenses / Gross Sales

5.6 Business risk

Many studies have earlier suggested that for a highly risky firm, debt ratio should not be high. Because for risky fir the bankruptcy cost is more, so the firm has to raise equity neither depend upon internal equity for finance. As per trade-off and pecking order theory, the debt ratio has a negative relationship with the business risk of the firm. Coefficient of variation of operating

profit is used to calculate the business risk and operating profit is calculated by deducting the operating expenses from the gross profit and it is also equal to the profit before interest & tax.

Business Risk = Coefficient of variation in operating profit

5.7 Non-debt Tax Shields

Items like depreciation, development rebate, research and development expenditure, preliminary and pre-operative expenditure and investment tax credits are not related to debt but also provide tax shield to the firm are called as non-debt tax shield. These items also offset the advantages of debt as a tax shield. So the firm's having more non debt tax shield, they will not depend upon the debt. Hence those firms will avoid more or less debt in their capital structure. For this reason trade-off theory suggests that both non-debt tax shield and debt ratio of the firm are sharing a negative relationship between them. Annual depreciation as a percentage of total assets has been taken to calculate the non-debt tax shield.

Non-debt Tax shield = Depreciation / Total Assets

5.8 Liquidity

If the agency cost of liquidity in a firm is very high then lenders will restrict on debt funding to the firm (Mayers and Rajan, 1998). Due to this there exists an adverse relationship between the liquidity and capital structure. According to Pecking Order theory, firms that maintain a high liquidity do not need an outsider's fund. But as per trade-off theory, firms having high debt can serve better to outsiders. So here a positive relationship exists between the liquidity and debt financing. Current assets and current liability has been taken to calculate the liquidity of a firm.

Liquidity = Current Assets / Current Liability

6.0 Data and Methodology

Here the study period expands from the year 2000 to the year 2010. The variables explained in the previous section were taken into consideration for the model. All the variables are taken as time-wise average for a period of 11 years. Instead of using panel data, time-wise average data are used for the analysis because when data were extracted from the database (CMIE), some specific data were not there for certain years. So the average of all the data for the period of 11 years and used the average data in time series regression for the analysis. Our study is based upon Indian steel companies' capital structure decision and its determinants. We selected steel sector for our study because of its vast contribution towards Indian GDP and economy. Here 66 steel companies are taken as a sample for this study and it includes both the listed and unlisted steel companies in India. Though there are more than 400 steel companies available in the industry but sample size is restricted to only 66 companies. The sample companies are selected on the basis of data available. The data for this study is taken from CMIE (Centre for Monitoring Indian Economy) data base.

This study focuses to identify the variables that affect the capital structure decision of the steel companies in India. For which we used methods like correlation matrix, multiple regression and step wise regression in this study. Here correlation matrix is used to understand the degree of linear relationship between the dependent and independent variables. Then it is followed by multiple regression model, it is used to explain the degree of impact on the dependent variables by the independent variables. Then a step wise regression is used in order to know the best combination of the independent variables that predict the dependent variable. Here all these models are carried out with the help of SPSS package.

7.0 Analysis of Data

7.1 Correlation Matrix

Correlation analysis is used here to analyse the linear relationship between the debt ratio and the independent variables. Here we have taken eight independent variables for this study. We have discussed these variables and their behaviors according to trade off and pecking order theory in the previous section. Now we can check it out whether these variables are acting in that manner or not. The result of the correlation is displayed in table-1. The analysis is carried out with the help of the SPSS package.

Table – 1: Correlation Matrix

Correlations

		DEBTRATI	SIZE	NDTS	ASSETSTR	PROFITAB	LIQUIDIT	UNIQUENE	RISK	GROWTH
DEBTRATI	Pearson Correlation	1	-.054	-.009	-.017	.633**	.035	-.006	-.078	-.229
	Sig. (2-tailed)	.	.669	.942	.892	.000	.778	.961	.531	.065
	N	66	66	66	66	66	66	66	66	66
SIZE	Pearson Correlation	-.054	1	.271*	.434**	-.059	-.123	-.041	.013	.274*
	Sig. (2-tailed)	.669	.	.028	.000	.637	.326	.743	.920	.026
	N	66	66	66	66	66	66	66	66	66
NDTS	Pearson Correlation	-.009	.271*	1	.677**	-.142	.093	-.136	-.082	-.063
	Sig. (2-tailed)	.942	.028	.	.000	.255	.456	.277	.511	.615
	N	66	66	66	66	66	66	66	66	66
ASSETSTR	Pearson Correlation	-.017	.434**	.677**	1	-.209	.006	-.114	-.210	-.044
	Sig. (2-tailed)	.892	.000	.000	.	.092	.962	.362	.091	.725
	N	66	66	66	66	66	66	66	66	66
PROFITAB	Pearson Correlation	.633**	-.059	-.142	-.209	1	.163	-.121	.288*	.022
	Sig. (2-tailed)	.000	.637	.255	.092	.	.192	.332	.019	.863
	N	66	66	66	66	66	66	66	66	66
LIQUIDIT	Pearson Correlation	.035	-.123	.093	.006	.163	1	-.044	.019	-.108
	Sig. (2-tailed)	.778	.326	.456	.962	.192	.	.725	.881	.389
	N	66	66	66	66	66	66	66	66	66
UNIQUENE	Pearson Correlation	-.006	-.041	-.136	-.114	-.121	-.044	1	-.330**	-.021
	Sig. (2-tailed)	.961	.743	.277	.362	.332	.725	.	.007	.869
	N	66	66	66	66	66	66	66	66	66
RISK	Pearson Correlation	-.078	.013	-.082	-.210	.288*	.019	-.330**	1	.167
	Sig. (2-tailed)	.531	.920	.511	.091	.019	.881	.007	.	.180
	N	66	66	66	66	66	66	66	66	66
GROWTH	Pearson Correlation	-.229	.274*	-.063	-.044	.022	-.108	-.021	.167	1
	Sig. (2-tailed)	.065	.026	.615	.725	.863	.389	.869	.180	.
	N	66	66	66	66	66	66	66	66	66

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

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

From the above table, we can found out that debt ratio is highly correlated with profitability with 1% level of significance whereas other variables are not highly correlated. Among the

independent variables we found that the correlations among assets structure, size and non-debt tax shield are significant at 1% level. Six out of eight independent variables act negatively with the debt ratio while only two variables namely liquidity and profitability is having a positive relationship with the debt ratio. Almost all these variables are behaving as per the earlier theories except one variable i.e. asset structure. Here we found that there exist a negative relationship between the asset structure and the debt ratio. While researchers have opined that a positive relation is expected as the non current asset portion will increase in the total asset will provide a good collateral value to the financers. Hence it can be said that in case of steel company's asset structure do not have a significant role in the debt ratio.

7.2 Regression Result Analysis

After studying the correlation matrix we proceed with multiple regression method. Multiple regression is used here to describe the dependence of debt ratio on the independent variables. All the eight variables discussed in the previous section were taken as independent variable for this study and the model is represented below.

Debtrat = $\alpha + \beta_1$ sz + β_2 ndts + β_3 asststr + β_4 profitab + β_5 liquidit + β_6 unique + β_7 risk

+ β_8 grot + e

Where Debtrat = Debt ratio, SZ = Size, ndts = non debt tax shield, profitab = profitability,

Liquidit = Liquidity, Unique = Uniqueness, Risk = Business risk, Grot = Growth.

All the above variables are based upon the time series average over a period of eleven years. This study is a cross section regression analysis using time series average data and this approach is preferred over panel regression analysis. The results of the regression analysis are shown below.

Table – 2: Model Summary

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.729[a]	.531	.465	.23520	1.687

a. Predictors: (Constant), GROWTH, UNIQUENE, LIQUIDIT, ASSETSTR, PROFITAB, RISK, SIZE, NDTS

b. Dependent Variable: DEBTRATI

Table – 3: Regression Coefficient

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.498	.143		3.492	.001		
	SIZE	.001	.018	.006	.056	.956	.710	1.408
	NDTS	.762	2.586	.037	.295	.769	.526	1.901
	ASSETSTR	.129	.339	.053	.381	.704	.431	2.319
	PROFITAB	1.866	.246	.741	7.586	.000	.863	1.159
	LIQUIDIT	-.023	.021	-.106	-1.132	.262	.933	1.072
	UNIQUENE	.117	1.530	.008	.077	.939	.847	1.180
	RISK	-.035	.015	-.238	-2.282	.026	.760	1.317
	GROWTH	-.761	.347	-.213	-2.194	.032	.870	1.149

a. Dependent Variable: DEBTRATI

Table - 4: ANOVA

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.571	8	.446	8.068	.000[a]
	Residual	3.153	57	.055		
	Total	6.724	65			

a. Predictors: (Constant), GROWTH, UNIQUENE, LIQUIDIT, ASSETSTR, PROFITAB, RISK, SIZE, NDTS

b. Dependent Variable: DEBTRATI

From the above table – 2, it can be seen that the R square is .53, which means that overall 55% of the variation happened in the debt ratio is explained by the independent variables. The F value of 8.068 and P value of 0.000 in the ANOVA table says that the model is statistically significant. Hence overall, it can be said that the independent variables that are used for this model is explaining the dependent variable significantly and the model is fit. If we look into the values of regression coefficients then it is seen here that independent variables like profitability, risk and growth out of eight variables are significant at 1%, 2.6% and 3.2% level respectively and profitability is sharing a positive sign and risk and growth is sharing a negative sign with debt ratio as expected by the trade off theory.

Another factor which is important to check is the multicollinearity problem, whether in this study the multicollinearity exists. So here the variance inflating factor (VIF) is calculated for each variable. From the VIF column, it can be found that none of the variable has crossed the benchmark of 5-10. The benchmark set by Gujarati and Sangeetha (2007) for VIF is 5-10, if any variable has the VIF of 5-10 then a multicollinearity problem exist. But no multicollinearity problem found in our study.

We can infer from the result that these steel companies' debt portion is positively influenced by the profitability and negatively with the growth and risk. If we look into the average performance of the profitability in terms of PBIT to capital employed is not so good i.e. only 15%, so the steel companies need to improve its profitability by reducing the cost and by increasing the production efficiency. Because profitability of a firm can absorb the interest cost of the debt and it will enhance the debt portion of the company. Growth rate of the business showed a negative coefficient with the debt ratio. This means debt ratio decreases with the increase in the growth rate of the steel companies. It is quite obvious that a high growth firm may tend towards high

risk which will negatively affect the lenders' sentiment. In other words it can be said that high growth rate has attracted the equity investor and distracted the lenders in the case of steel industry. Mostly we found that the growth rate of steel companies has decreased since 2007 due to the global economic downturn and slow infrastructure growth. So it is obvious that a slow economy will lower the consumption of iron and steel and its growth rate. But the current new land acquisition bill and mining bill will definitely boost the growth rate of this industry and its profitability.

Another important factor that we found is highly influencing the debt ratio is the business risk. Business risk showed a negative relationship with debt ratio which means if risk will increase then debt ratio will decrease. It is quite evident that debt increases the bankruptcy cost so the steel company needs to maintain a proper mix of debt and equity in their capital structure. Again at the time of slow economic growth the firms need to reduce its debt portion in their capital structure. Because debt bears a fixed percentage of interest that the firms need to pay even if the firms make loss. Hence in rough times debt can be a burden for the companies.

It was found that other explanatory variables like size, non-debt tax shield, asset structure, liquidity and uniqueness are very insignificant in explaining the debt ratio of the steel companies. Variables like size and assets structures majorly consist of fixed assets did not influence the debt ratio which means that majority of the debt portion were not raised against fixed assets. Further it was found that regression coefficients' sign of the factors like size, assets structure, profitability, risk and growth are following the trade-off theory.

7.3 Step-wise Regression Analysis

Here stepwise multiple regression is used to get the best combination of the independent variables that can predict the dependent variable significantly. In stepwise regression dependent variables are entered into the equation one at a time and each time the weak dependent variable will be removed from the equation. Only those variables are included that are really significant to the equation.

Table – 5: Stepwise regression coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.432	.049		8.824	.000		
	PROFITAB	1.595	.244	.633	6.542	.000	1.000	1.000
2	(Constant)	.433	.046		9.365	.000		
	PROFITAB	1.801	.240	.715	7.498	.000	.917	1.090
	RISK	-.041	.014	-.284	-2.981	.004	.917	1.090
3	(Constant)	.534	.063		8.428	.000		
	PROFITAB	1.786	.233	.709	7.671	.000	.916	1.091
	RISK	-.036	.014	-.249	-2.653	.010	.891	1.122
	GROWTH	-.722	.320	-.202	-2.256	.028	.971	1.030

a. Dependent Variable: DEBTRATI

Table – 6: ANOVA

ANOVA [d]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.694	1	2.694	42.796	.000[a]
	Residual	4.029	64	.063		
	Total	6.724	65			
2	Regression	3.193	2	1.596	28.479	.000[b]
	Residual	3.531	63	.056		
	Total	6.724	65			
3	Regression	3.460	3	1.153	21.913	.000[c]
	Residual	3.264	62	.053		
	Total	6.724	65			

a. Predictors: (Constant), PROFITAB

b. Predictors: (Constant), PROFITAB, RISK

c. Predictors: (Constant), PROFITAB, RISK, GROWTH

d. Dependent Variable: DEBTRATI

Table – 7: Model Summary

Model Summary[d]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.633[a]	.401	.391	.25092	
2	.689[b]	.475	.458	.23675	
3	.717[c]	.515	.491	.22943	1.568

a. Predictors: (Constant), PROFITAB

b. Predictors: (Constant), PROFITAB, RISK

c. Predictors: (Constant), PROFITAB, RISK, GROWTH

d. Dependent Variable: DEBTRATI

If we see the result of the stepwise regression, then we will find that there are three significant models in the result. Model.1 suggests that profitability is the most important explanatory variable that explains the debt ratio of the steel companies and profitability is also sharing a positive relationship with the debt ratio. Next important variables that entered in the models are risk and growth and both are sharing a negative relationship with the debt ratio. From the model summary table it is found that these three variables in the last model explain 52% of variability in the debt ratio of steel company. Rest variables are excluded from the models as their contribution in explaining the dependent variable is negligible. From the ANOVA table it can be found that all the models are statistically fit as all the models are having p value of 0.000 respectively.

8.0 Summary and Conclusion

This paper is an experiment to analyze the capital structure and its determinant of the Indian steel companies with the help of the correlation analysis, multiple regression analysis and stepwise regression analysis. It was found that the steel companies that are taken as sample are debt driven means relying more on debt. So here we tried to find out which factors that are significantly

affecting the debt ratio. Hence eight explanatory variables are taken into consideration and we found that explanatory variables like profitability, risk and growth are playing a significant role in explaining the debt ratio of the Indian steel companies. Hence steel companies need to reduce their cost or to improve their efficiency level in order to increase their profitability. Another important factor that companies need to reduce is the risk factor, if the risk factor will be high then automatically lenders will move away and may not be willing to put their money is risky business. Other explanatory variables are like size, asset structure, non debt tax shield, liquidity and uniqueness are not significant here.

If we consider the signs of the regression coefficients then we found that these signs are following the trend of trade off theory and not so much of pecking order theory. However this study has some limitations like here the size of the sample is limited to only 66 companies and limited to only one sector. Hence more sectors can be taken and a cross sectional study can be done.

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