



**“AN EMPIRICAL STUDY ON CAPITAL STRUCTURE DECISION OF
SELECT IRON AND STEEL MANUFACTURING COMPANIES IN
INDIA”**

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ABSTRACT

This paper try to examine the firm precise factors which determine the capital structure decisions which is an essential for every company in specific to Iron and Steel Manufacturing companies of India. Based on the market capitalization, top ten Iron and Steel Manufacturing companies listed in NSE are selected. Using multi regression model, accounting data of companies over a period of 10 years from 2008-2017 is chosen and the empirical study is conducted. Firm specific factors such as tangibility, firm size, liquidity, non debt tax shield, debt-equity, growth rate and profitability have been analyzed to check their influence on the leverage structure of the selected Iron and Steel Manufacturing companies in Indian context. Total debt leverage is taken as dependent variable and firm specific factors are taken as independent variables. It has been found from the study that except for non debt tax shield all the other factors like tangibility, liquidity, profitability, debt-equity, growth rate and firm size are statistically significant determinants of capital structure of the listed Iron and Steel Manufacturing companies.

Key words: Profitability, Capital structure, growth, leverage, tangibility, liquidity, variables.

INTRODUCTION

Capital structure refers to the mix of different securities known as debt equity ratio in a corporate firm. Capital structure decisions are considered to be one of the most crucial decisions of a company as it has a direct bearing on the success or failure of the company. A number of theories have been proposed and lot of research has been done in the past few decades on the capital structure decisions and the factors which influence them. This topic acquired special significance after the publication of seminal papers by Modigliani and Miller (1959, 1963). But neither the research nor the theory has been able to provide satisfactory explanation as to what factors affect the capital structure decisions (Brealey and Myers 1991).

Extensive research has been conducted on developed markets whereas emerging economies is still deficient of such meticulous investigation. There have been quite a few significant papers conducted on country-to-country comparisons (De Jong et al., 2008; Rajan and Zingales, 1995; Booth et al., 2001). Researchers like Bhaduri (2002), Harvey et al (2004) etc have focused on a few European and Asian countries. Bhaduri has conducted research specific to India with highly significant results but chose a limited number of variables and small sample due to limitation of data. Theoretical papers in this field have been even rarer.

Several researchers including Milton (2006), have already exposed the tendency of convergence between emerging markets and developed economies. The emerging markets are steadily reaching the debt levels of developed countries. It would be convenient if the finding of the developed markets research when dealing with any capital structure problems is applied on emerging markets. However, the matter is not as straightforward as that seems to be. It is crucial to be sure that the companies, operating in emerging or developed capital market, actually follow the worldwide tendencies and that they choose their capital structure following the same logic. Alves and Ferreira (2007); La Porta et al (1998, 2000) and several others argued that the determinants of Capital Structure are significantly affected by jurisdictional factors like

Corporate and Personal Tax System, Corporate Governance, Laws and Regulations of the country.

Similarly, the development of the bond/capital markets, Rule of Law, Credit/Share holders Protection, etc, are quite specific to individual countries. It is therefore, very important to study individual emerging countries by themselves rather than the countries pooled together.

Due to the uniqueness of India as a country, it is important to understand the behavior of the firms by studying the country individually.

There is also limited work done specific to India related to capital structure theories and determinants (Booth (2001), Bhaduri (2002); Singh and Kumar (2008); Farhat et al (2009),). India as an emerging economy is based on common law with comfortable external debt environment. It has the potential for enormous expansion and the economy has been growing significantly in recent years. Hence it becomes important for us to understand the significance of capital structure decisions at the macro and micro level of financing. (Joy Pathak) At the same time there are several firm specific and country specific factors which influence the capital structure decisions of publicly traded firms in India. Hence it is extremely important for finance policy-makers at the firm or aggregate level to understand what drives corporate financing.

IRON AND STEEL INDUSTRY:

India's Iron and Steel industry is one of the fastest developing sectors in Indian Economy. At present the Iron and Steel produces 110 million tones and it is one of the largest sector in the Indian Economy. This sector contributes 7 to 7.5% to the Indian GDP. India was the third largest steel producer in the world in 2017. Growth in India's iron and steel sector is due to the domestic comfort of raw materials, iron ore and lucrative employment. As a result, the steel sector has become a major contributor to the production of manufacturing sectors in India. The iron and steel industry is one of the most important industries in India. In 2014 and 2015, India was the third largest producer of rough steel and also the world's largest producer of sponge iron. The steel industry produced 91.46 million tons of total final steel and 9.7 million tons of iron ore. (www.ibef.org)

LITERATURE REVIEW

Some of the studies published in the relevant literature on capital structure decisions concerning the developed and developing economies have been included.

D Rakeshkumar Rasiklal Jani (2015): This paper tells about the determinants of capital structure in Automobile segment from 2009 to 2013 involving 3 organizations. The impact of Debt-Equity ratios on other ratio is been investigated in this review. The determinants of short term and long-term debt ratios and determinants of aggregate debt ratios is been considered.

Md. Suresh Babu.N, Prof. Chalam.G.V (2016): Capital structure and its determinants of Automobile organizations have been analyzed in this paper. 58 Indian Automobile organizations listed on the Bombay stock exchange from the period 1997-98 to 2010-14 of around 17 years has been analyzed. The Results demonstrates that the factors of profitability, size, substantial quality, development, and non-debt impose shield are contrarily related with leverage and risk and liquidity are emphatically related with leverage.

Md. Ashraf chesti, Md. Khursheed Ali, Mr. Mouhidin sangmi (2013): Attempt is made in order to learn the effect of capital structure on the profitability of a firm. Automobile industry is concentrated in this review. Around ten organizations for a period of five years are chosen for this study. The scientists have calculated different ratios to accomplish the destinations of the review. The discoveries have revealed that capital structure have measurably critical effect on the organizations profitability. Debt to Equity ratio is related contrarily to the profitability ratios.

Mohan KumarM.S, Dr. Aswata Narayana T & Rashmi B.H. (2016): In this study the data collected from secondary source of the organization's annual reports. Top five automobile companies are selected which are listed in Bombay Stock Exchange on basis of sale turnover. The study concludes that there is a positive correlation between DCL, DOL, & EPS and correlation is negative between DFL, EPS, DER is there & among majority of the companies selected for the study during study period. This study found that there is positive correlation between DCL, DOL & EPS which shows that there is a major relationship between, Degree of combined leverage, Degree of operating leverage & EPS. There is a high financial risk for the

Eicher motor and high earning capacity for force motor among the companies selected for the study.

N R Parasuraman and P Janaki Ramudu (2013): demonstrated as to how Indian firms went about in designing their capital structure positions. Regression with ENTER & STEP method has been used. The analysis revealed that the capital structure decisions of Indian firms depended largely on profitability in general and ROCE and RONW in specific in most of the years.

Joy Pathak (2010): examines the relative importance of six factors in the capital structure decisions of publicly traded Indian firms using two independent ordinary least square regression. The objective of this paper is to build on previous studies on the Indian capital market and model all the important factors affecting capital structure decisions of Indian firms post liberalization policy by Government of India. It has been found that factors such as tangibility of assets, growth, firm size, business risk, liquidity, and profitability have significant influences on the leverage structure chosen by firms in the Indian context.

Stein Frydenberg (2004): The author reviews various capital structure theories in this paper. He argues that what could determine capital structure are the pecking order theory and the static trade off theory. But after the review it has been found that neither of them provides a complete description of the situation and why some firms prefer equity and others debt under different circumstances. The paper is ended by a summary where the option price paradigm is proposed as a comprehensible model that can augment most partial arguments.

Frank and Goyal (2007): In this paper trade-off, pecking order and market timing theory has been analyzed. Factors such as industry median, market to book asset ratio, tangibility, profitability, firm size and expected inflation has been considered for leverage decisions. The empirical evidence seems reasonably consistent with some versions of the tradeoff theory of capital structure.

Kakani & Reddy (1998): This paper provides an empirical examination of the determinants of various capital structure theories. It attempts to develop and test a new theory on capital structure for large manufacturing firms in India. For different empirical and managerial implications short

term and long term debt instruments have been measured. The results found are contrary to the classical financial theory.

Objective & Methodology

The objective of this paper is to analyze the importance of firm specific factors in the capital structure decisions of iron and Steel Manufacturing companies in India. Further this paper focuses on examining whether the firm specific factors such as tangibility, firm size, liquidity, non debt tax shield, debt-equity, growth rate and profitability affect the leverage structure of Iron and Steel Manufacturing companies of India. Based on the market capitalization, top ten Iron and Steel Manufacturing companies traded in NSE are selected. The ratios are calculated from the income statement and balance sheet of companies for a period of ten years ranging from 2008-2017. The data for the empirical analysis is sourced from Moneycontrol.com.

The ten companies chosen are JSW Steel Ltd., TATA Steel Ltd., SAIL Ltd., Jindal Steel 7 Power Ltd., APL Apollo Tubes Ltd., Ratnamani Metal & Tubes Ltd., Jindal Stainless Ltd., Welspun Corp. Ltd., Jindal Saw Ltd., TATA Metaliks Ltd. Multi regression model is used to arrive at the empirical results with total leverage as dependent variables and firm specific factors like profitability, tangibility, liquidity, non debt tax shield, debt-equity ratio, growth rate and firm size as independent variables.

Leverage

As can be seen in the literature, various definitions of leverage exist. All these characterizations of leverage revolve around some form of debt ratio. The definitions depend on whether market value or book values are used.

In addition, definitions also depend on whether short term debt, long-term debt or total debt is used. Firms have several types of assets and liabilities and there can be further adjustments made to the definition. For this study, two definitions of leverage has been used and the data is presented accordingly.

Total Debt Leverage: This leverage definition uses a sum of debt in current liabilities and long term debt over the total assets (De Jong et al (2008)).

Firm Specific Independent Variables

a) Tangibility

Tangibility is the characteristic that an asset can be used as collateral to secure debt. Myers and Majluf (1984) argued that firms with more collateral value in their assets tend to issue more debts to take the advantage of low cost.

b) Firm Size

Firm size has been proposed to be a critical variable identified with the use proportions of the firm. It is also argued that relatively large firms tend to be more diversified and thereby less prone to bankruptcy. Consistent with these arguments, we use firm size as an inverse proxy for the probability of bankruptcy,

c) Profitability

To take into account asymmetric information issues it is common to use variables such liquidity and profitability. A study by Booth et al (2001) recommended that productive firms may have the capacity to fund their development inside by utilizing held profit while keeping up a consistent obligation value proportion though, less profitable firms have no such decision and are compelled to go for obligation financing.

d) Debt Equity ratio:

The debt to equity ratio shows the ratio of capital and debt used by the company to finance its assets and the extent to which shareholders' capital is able to meet its obligations to creditors in the event of a downturn in business. The low debt-to-capital ratio indicates a diminished paying off debtors financing through loan specialists as opposed to financing through capital through investors.

e) Liquidity

Consistent with De Jong et al (2008) we agree that the liquidity is the accumulated cash and other liquid assets will serve as the internal source of fund and will be utilised first instead of debt. Therefore, we propose that liquidity has a negative effect on leverage.

Liquidity was calculated by dividing the total current assets over the total current liabilities.

- f) **Non debt tax shield:** This ratio is calculated in relation to depreciation and total assets Kavitha (2014).
- g) **Growth rate:** This ratio is the annualized growth rate of revenue, earnings and dividend. Keshar J Baral (2004)

Statement of Hypotheses

This study has tested the following null hypothesis on relation between the above defined independent variables and leverage of listed Iron and Steel Manufacturing companies:

H0: Total leverage is not influenced by profitability, liquidity, debt-equity ratio, tangibility, non-debt tax shield, firm size and growth rate.

H1: Total leverage is influenced by profitability, liquidity, debt-equity ratio, tangibility, non-debt tax shield, firm size and growth rate.

The regression equation is shown below:

$$LEV(TD) = \beta_0 + \beta_1 TANG + \beta_2 SIZE + \beta_3 PROFIT + \beta_4 LIQUID + \beta_5 NDTs + \beta_6 GR + \beta_7 DER + \epsilon_i$$

Model Diagnostics

Table 1 provides the descriptive statistics for all the variables. Now looking at the diagnostics in Table 3 of the regression model it can be seen that the significance level is .020 which says that the H₀ is rejected. That is there is a significant influence of all the independent variables on total leverage.

Table 1: Showing the descriptive statistics of selected companies:

Descriptive Statistics

	Mean	Std. Deviation	N
total leverage	2.322600	2.0778386	100
profitability ratio	16.774000	26.6414989	100
liquidity ratio	1.404200	1.0778309	100
tangibility	.674200	.2691820	100
debt-equity ratio	101.910400	129.1586728	100
firm size	3.807700	.6113734	100
non debt tax shield	.208500	.1379751	100
growth rate	11.623500	21.4381315	100

Table 2: Showing the variables Entered for the selected companies:

Variables Entered/Removed

Model	Variables Entered	Variables Removed	Method
1	growth rate, debt-equity ratio, firm size, profitability ratio, non debt tax shield, tangibility, liquidity ratio		. Enter

a. Dependent Variable: total leverage

b. All requested variables entered.

**Table 3: Showing the correlation of the selected companies:
Correlation**

Particular		Total leverage	Profitability Ratio	Liquidity Ratio	Tangibility ratio	Debt-Equity Ratio	Firm Size	Non Debt Tax Shield	Growth Rate
Pearson Correlation	Total leverage	1.000	.243**	.178*	-.019	.032	-.056	-.231*	.199*
	Profitability Ratio	.243**	1.000	.147	-.173*	-.154	-.272**	.031	.086
	Liquidity Ratio	.178*	.147	1.000	-.420**	.088	-.478**	-.261**	.176*
	Tangibility ratio	-.019	-.173*	-.420**	1.000	.234**	.403**	.178*	-.177*
	Debt-Equity Ratio	.032	-.154	.088	.234**	1.000	.133	-.239**	.036
	Firm Size	-.056	-.272**	-.478**	.403**	.133	1.000	.223*	-.104
	Non Debt-Tax Shield	-.231*	.031	-.261**	.178*	-.239**	.223*	1.000	-.224*
	Growth Rate	.199*	.086	.176*	-.177*	.036	-.104	-.224*	1.000
Sig. (1-tailed)	Total leverage		.007	.039	.425	.376	.289	.010	.023
	Profitability Ratio	.007		.073	.042	.063	.003	.380	.199
	Liquidity ratio	.039	.073		.000	.191	.000	.004	.040
	Tangibility ratio	.425	.042	.000		.009	.000	.038	.039
	Debt-Equity Ratio	.376	.063	.191	.009		.093	.008	.361
	Firm Size	.289	.003	.000	.000	.093		.013	.152
	Non Debt Tax Shield	.010	.380	.004	.038	.008	.013		.013
	Growth Rate	.023	.199	.040	.039	.361	.152	.013	
N	Total leverage	100	100	100	100	100	100	100	100
	Profitability Ratio	100	100	100	100	100	100	100	100
	Liquidity ratio	100	100	100	100	100	100	100	100
	Tangibility ratio	100	100	100	100	100	100	100	100
	Debt-Equity Ratio	100	100	100	100	100	100	100	100
	Firm Size	100	100	100	100	100	100	100	100
	Non Debt Tax Shield	100	100	100	100	100	100	100	100
	Growth Rate	100	100	100	100	100	100	100	100

*. Correlation is significant at the 0.05 level (1-tailed).

**. Correlation is significant at the 0.01 level (1-tailed).

Table 4: Showing the model summary of the selected companies:

Model Summary										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.401 ^a	.161	.097	1.9743497	.161	2.522	7	92	.020	2.231

a. Predictors: (Constant), growth rate, debt-equity ratio, firm size, profitability ratio, non debt tax shield, tangibility, liquidity ratio

b. Dependent Variable: total leverage

Table 5: Showing the ANOVA table of the selected companies:

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	68.803	7	9.829	2.522	.020 ^b
	Residual	358.621	92	3.898		
	Total	427.424	99			

a. Dependent Variable: total leverage

b. Predictors: (Constant), growth rate, debt-equity ratio, firm size, profitability ratio, non debt tax shield, tangibility, liquidity ratio

Table 6: Showing the coefficients of the selected companies:

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.028	1.698		.017	.987
	profitability ratio	.020	.008	.259	2.575	.012
	liquidity ratio	.325	.227	.169	1.431	.156
	tangibility	.959	.883	.124	1.087	.280
	debt-equity ratio	-.001	.002	-.046	-.432	.667
	firm size	.389	.398	.115	.978	.331
	non debt tax shield	-3.378	1.594	-.224	-2.120	.037
	growth rate	.013	.010	.133	1.332	.186

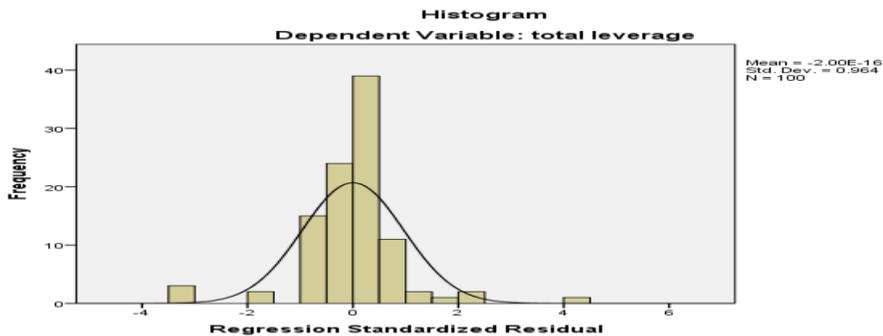
a. Dependent Variable: total leverage

**Table 7 Showing the Residuals Statistics of the selected companies:
Residuals Statistics^a**

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-.180211	4.490603	2.322600	.8336527	100
Residual	6.6965384	8.5873537	0E-7	1.9032700	100
Std. Predicted Value	-3.002	2.601	.000	1.000	100
Std. Residual	-3.392	4.349	.000	.964	100

a. Dependent Variable: total leverage

Graph 1: Showing the Histogram of the selected companies:



From the above study it can be said that all the independent factors have a significant influence on the capital structure decisions of Iron and Steel Manufacturing Companies listed in NSE.

There is further scope for research where in macro economic factors can also be considered to analyze the capital structure decisions of the selected companies.

Analysis:

To obtain an overview of the nature of data set, descriptive statistics analyses (minimum, maximum, mean, standard deviation) were employed for the dependent and independent variables.

Table 1 indicates that the highest mean value of debt-equity ratio 101.9104 whereas the non debt tax shield has 0.2085 the lowest value. The debt equity ratio has highest standard deviation of 129.1587 whereas the non debt tax shield has the lowest standard deviation of 0.1379.

Table 2 indicates that the variables entered or removed. In this table it shows the independent variables which are entered into the SPSS.

To check the degree of correlation and direction of relationship between the independent and dependent attributes of capital structure choice, the spearman's correlation is run using SPSS.

Table 3 indicates that the correlation coefficients among Total Leverage and all the independent variables are significant. Total leverage has positive significant relationship with the Profitability ($r = 0.243$), Liquidity ($r = 0.178$) and Growth rate ($r = 0.199$) respectively. This means that the industry which has high in Profitability, high Liquidity and high Growth rate tend to have less debt. In addition, Total Leverage is significantly and negatively related with relevance of non-debt tax shield ($r = -0.231$) this indicates that firms with high non- debt tax shield tends to have less debt.

Table 4 indicates the model summary of the selected companies. It presents the influence of independent variables on Total Leverage; the Durbin Watson Regression is run using SPSS. The significance level is 0.020 which is less than 0.05, hence the H_0 is rejected i.e., Null Hypothesis is rejected. Hence there is a significant influence of all the independent variable on Total Leverage.

Table 6 indicates the coefficients and significance level of all independent variables on Total leverage. Firm size is positively influencing the Total Leverage and is consistent with trade off theory with coefficient value of 0.115 which is significant. A large-sized firm tends to be diversified in its business and has a greater separation of ownership from management, thus more debt is preferred. Profitability is positively influencing the Total Leverage and is consistent with trade off theory with coefficient value of 0.259 which is significant. Companies with high profitability do not usually seek for debt financing, whereas companies with low profitability are prone to increase debt level. Because of higher profitability, firms may prefer to keep their profits in the company as an internal funding source.

The behaviour of firms in National Stock Exchange is following the Pecking Order Theory of Capital Structure. Based on table 5 Tangibility is insignificant as p-value is more than 0.05.

Tangibility is positively influencing the Total Leverage and is inconsistent with Static Trade off Theory with coefficient value of 0.124 which is significant. An explanation for this result could be that high tangible assets of a company give rise to reduce information asymmetry between management and outside investors; therefore, these companies tend to issue the shares (equity). This research has displayed a positive relationship between growth and capital structure with coefficient value of 0.133 which is consistent with pecking order theory.

Thus, these findings suggest that higher leveraged company most probably passes up profitable investment opportunities; therefore, firms with high future growth opportunities should use more equity financing. Such financing effectively transfers wealth from stockholders to debt holders.

CONCLUSION

Trade-off theory and pecking order theory are two main theories which affect the capital structure decision of firm either positively or negatively. First is the Trade-off theory which explains the trade-off between the cost of bankruptcy and benefits of tax shield. Second is pecking order theory which developed by Myers and Majluf (1984). The behaviour of firms in Tehran Stock Exchange shows that a large-sized company is less likely to become bankrupt, and therefore attracts more debt, supporting the static trade off theory. Profitability variable is positively related to Total Leverage and is consistent with the results of previous researches. The firms with higher profitability prefer equity financing than debt financing in the business and the result is significant, supporting the pecking order theory. In addition growth positively related to Total Leverage. Firms with high growth opportunity do not seek for debt financing and it is consistent with pecking order theory. In summary, this paper extends our understanding of the trade-off theory and pecking order theory in capital structure in explaining the financing choice of Iron and Steel Companies Listed in National Stock Exchange of India. The findings of this study generally suggest that financial factors are an important determinant of National Stock Exchange's capital structure. It is, however, important for future research to also consider the financial issue in explaining the capital structure of National Stock Exchange in order to better appreciate the relationship.

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