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Comparative Analysis of Capital Structures and its Impact on the Financial Performance of Top Steel Companies in India

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ABSTRACT

Capital structure is one of the most important areas of financial decision making. In this study we attempt to examine capital structure and its impact on financial performance of selected Indian Steel Companies during the year 2015 and 2016. Correlation, ANOVA and multiple regression models are used to analyze the data for the study. Firstly, we computed Gross Profit Margin (GPM), Net Profit Margin (NPM) and Return on Capital Employed (ROCE) as an indicator of financial performance (dependent variables) and Debt Equity Ratio (DER), Interest Coverage Ratio (ICR) and Debt Assets Ratio (DAR) as measures of capital structure (independent variables). The result of multiple regression and ANOVA indicated that there is a significant impact of capital structure on financial performance of Indian Steel Industry. Correlation results confirmed that there is negative relationship between Capital Structure and financial performance. The result of the study serves as a guide to creditors, management, financial institutions and other users to take better investment, financing and capital decisions.

Keywords: *Capital Structure, Financial Performance, Profitability, Multiple Regression and Indian Steel Industry.*

1. 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. Generally, a firm has an internal and an external source of fund to finance their investments. Internal sources include retained earnings and owners fund, whereas the external sources consist of new borrowings or the issue of shares. The financing decision mainly involves two choices. The first is the dividend choice- the distribution of retained earnings to be ploughed back and to be paid out as dividends. The second is a choice of capital structure- the proportion of external finance to be borrowed and the proportion to be raised in the form of new equity. In real

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sense, the decisions about both the choices should not have impact on the value of the firm because these decisions are related to either the form of distribution, type of security, or make up of the ownership structure, but not to the investment.

Capital structure decisions have great impact on the firm's financial performance. Exactly how firms choose the amount of debt and equity in their capital structures remain an enigma. The effective financing decision determines the optimal mix of debt and equity with respect to the relative numbers of shareholders and debt holders and the distribution of investment proceeds between dividends, interest and capital gains. To be specific, Capital structure decisions is not only based on the internal environment of the company but also on the external environment of the firm including corporate governance, legal framework and institutional environment of the countries in which the firm operates. The effective strategic management of capital structure ensures the availability of required fund to finance the future growth and enhance the financial performance.

The debt equity relationship depends upon the nature of industries involved like company's line of business and its development. A company is said to be highly leveraged, if it includes the maximum debt source of finance in its capital structure which makes, the company find its freedom of action restricted by its creditors and may have its profitability affected with the payment of high interest costs. Similarly, this paper focuses on the comparative analysis of various steel companies' capital structure and determines its affects and effects.

2. INDIAN STEEL INDUSTRY

India's economic growth is contingent upon the growth of the Indian Steel Industry. Consumption of steel is taken to be an indicator of economic development. While steel continues to have a stronghold in traditional sectors such as construction, housing and ground transportation, special steels are increasingly used in engineering industries such as power generation, petrochemicals and fertilisers. India occupies a central position on the global steel map with the establishment of new state-of-the-art steel mills, acquisition of global scale capacities by players, continuous modernisation and up gradation of older plants, improving energy efficiency and backward integration into global raw material sources. India is the world's third-largest producer of crude steel (up from eighth in 2003) and is expected to become the second-largest producer by the end of 2017. The growth in the Indian steel sector has been driven by domestic availability of iron ore and cost-effective labour. Consequently, the steel sector has been a major contributor to India's manufacturing output.

The Indian Steel Industry is very modern with state-of-the-art steel mills. It has always strived for continuous modernisation and up-gradation of older plants and higher energy efficiency levels.

Indian Steel Sector's contribution to overall Gross Domestic Product of the country was nearly 2% during 2015-16.The Indian steel industry has entered into a new development stage from 2007-08, riding high on the resurgent economy and rising demand for steel.

Rapid rise in production has resulted in India becoming the 3rd largest producer of crude steel in 2015 and the country continues to be the largest producer of sponge iron or DRI in the world.

As per the report of the Working Group on Steel for the 12th Five Year Plan, there exist many factors which carry the potential of raising the per capita steel consumption in the country. These include an estimated infrastructure investment of nearly a trillion dollars, a projected growth of manufacturing from current 8% to 11-12%, increase in urban population to 600 million by 2030 from the current level of 400 million, emergence of the rural market for steel currently consuming around 10 kg per annum buoyed by projects like Bharat Nirman, Pradhan Mantri Gram

SadakYojana, Rajiv Gandhi AwaasYojana among others.

The National Steel Policy 2005 had estimated steel production to reach 110 million tonnes (mt) by 2019-20. However, based on the assessment of the current ongoing projects, both in greenfield and brownfield, the Working Group on Steel for the 12th Five Year Plan has projected that domestic crude steel capacity in the county is likely to be 140 mt by 2016-17 and has the potential to reach 149 mt if all requirements are adequately met.

3. OBECTIVES OF THE STUDY

1. To study the relationship between capital structure and financial performance of steel companies.
2. To study the impact of capital structure on the financial performance of the company.

4. RESEARCH METHODOLOGY

A) Type of Research

The type of research is descriptive in nature.

B) Data Collection

The data is collected from secondary sources like books, periodicals, annual reports of companies, websites, Ace-Equity database and E-Resource database.

C) Sample

The top 13 steel companies have been chosen as sample size on the basis of Turnover as on 31.3.2016.

Company's Name	Turnover in Cr. as on 31.3.2016.
Steel Authority of India (SAIL) Ltd.	39,086.24
Tata Steel Ltd.	38,210.34
JSW Steel Ltd.	36,706.92
Rashtriya Ispat Nigam Ltd.	12,110.69
Electrosteel Steels Ltd.	2,597.69
Steel Exchange India Ltd.	1,671.14
Technocraft Industries (India) Ltd.	765.52
Gallantt Ispat Ltd.	534.76
Beekay Steel Industries Ltd.	519.33
Visa Steel Ltd.	505.26
Adhunik Industries Ltd.	410.08
Bhuwalka Steel Industries Ltd.	392.52
OCL Iron & Steel Ltd.	355.8

Source: E-Research database.

D) Time Period:

This research Paper covers a period of 2 financial years (2015 & 2016).

E) Data Analysis Method:

Correlation and multiple regression analysis were used to examine the relationship between dependent and independent variables.

Independent Variable	Dependent Variables
1. Debt-Equity Ratio.	1. Profit Margin(GPM)
2. Interest Cover Ratio.	2. Net Profit Margin (NPM)
3. Debt-Asset Ratio.	3. Return on Capital Employed (ROCE)

F) Limitations of the Study:

1) The study is restricted to only top 10 steel companies.

2) The study is made only for a period of 2 years.

3) Non availability of sufficient data in case of certain companies.

5. LITERATURE REVIEW

Poddar & Mittal, January (2014) applied panel data analysis techniques to study the borrowing pattern of the five Indian companies of steel sector with respect to size, profitability, liquidity and interest coverage and concluded that larger firms usually require larger amounts of debt capital than smaller firms because of which larger firms are usually able to reduce transaction costs associated with long-term debt issuance and can arrange a lower interest rate.

Singh & Luthra, June (2013) have studied the trends in financing pattern and the Debt Equity ratio for metal industry using secondary data and found that that this industry has access to markets for both equity and debt financing. Initially they found that the companies were raising maximum debt fund to reduce the cost of capital but this resulted in increase in financial risk. They hence concluded that an optimal capital structure is that which maximizes the shareholder's wealth with best combination of debt and equity mix by minimizing the firm's cost of capital.

Pal, December (2012) applied multiple regression analysis on fifteen financial ratios from different segment like liquidity, solvency, activity and profitability such as current ratio, quick ratio, absolute quick ratio to compare the financial performance of Indian steel companies under globalization and concluded that sales of Indian steel companies is not the main determinant for the profit maximization, liquidity, profitability, activity & financial leverage also play an important role in overall profitability maximization.

Takeh & Navaprabha, (2012) have studied the relationship between the capital structure and financial performance and also the impact of capital structure on financial performance using Descriptive Statics and Multiple linear Regression, ANOVA to test the hypothesis. They found that there is a negative relationship between capital structure and the financial performance of Indian Steel Industry and also that the capital structure has a great impact on financial performance of Indian Steel Industry.

Maheshwari. S.N., (2009) studied the capital structure of the steel companies in Tamil Nadu and found that there were several factors determining the capital structure such as Cost of Capital, Market Conditions, Internal Conditions, Growth Rate, Flotation Cost, Flexibility, Taxes, Leverage effect etc. and each one had some or the other effect in the capital structure of the companies.

Panda, Mohapatra & Moharana, (2006) used multiple and step wise regression method to analyze the capital structure of Indian steel companies and found out that the most of the steel companies are debt driven. They also found out that, explanatory variables like profitability, risk and growth play a significant role in explaining the debt ratio of the Indian steel companies.

Chaudhary, Panigrahi, & Meher, (2005) analyzed the financial statements of Steel Authority of India Limited (SAIL) to find out that the losses incurred by the company was the outcome of an unbalanced finance mix. The

Debt-Equity ratio of the company was high suggesting high amount of debt in the capital structure. It had reduced the owner's fund and confidence as the risk of the equity holders increase with increase in loans.

6. RESULTS AND INTERPRETATION

The Analysis carried out here is first according to the year wise data and then a combined analysis of both the years taken together is carried out.

6.1. Analysis for the Year 2015

1) Gross Profit Margin (Dependent Variable-1)

a) Correlation Analysis

Table 6.1(1a): Correlations

		Gross Profit Margin 2015	Debt Equity Ratio 2015	Interest Cover Ratio 2015	Debt Asset Ratio 2015
Pearson Correlation	Gross Profit Margin 2015	1.000	-.337	.307	-.382
	Debt Equity Ratio 2015	-.337	1.000	-.348	.806
	Interest Cover Ratio 2015	.307	-.348	1.000	-.537
	Debt Asset Ratio 2015	-.382	.806	-.537	1.000
Sig. (1-tailed)	Gross Profit Margin 2015	.	.171	.194	.138
	Debt Equity Ratio 2015	.171	.	.162	.002
	Interest Cover Ratio 2015	.194	.162	.	.055
	Debt Asset Ratio 2015	.138	.002	.055	.
N	Gross Profit Margin 2015	10	10	10	10
	Debt Equity Ratio 2015	10	10	10	10
	Interest Cover Ratio 2015	10	10	10	10
	Debt Asset Ratio 2015	10	10	10	10

The correlation table shows that there is a moderate negative correlation between DER, DAR and GPM which means with the increase in DER or DAR the GPM will decrease on account of increased production which will lead to increase in COGS. The table shows that ICR is having a moderate positive correlation with GPM which means that with increase in ICR the GPM will also increase on account of increased sales revenue to meet out the increased demand in the market.

b) Regression Analysis

Table 6.1 (1b-1): Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.407[a]	.165	.252	18.52275

a. Predictors: (Constant), Debt Asset Ratio 2015, Interest Cover Ratio 2015, Debt Equity Ratio 2015

The Model Summary table shows the impact of all the independent factors on the dependent factor which is measured by r square.

The R square value in the table shows that GPM is affected only 16.5% by capital structure and 83.5 % by other internal and external factors like market conditions, demand and supply, government policies, liquidity, investment and working capital decisions.

Table 6.1(1b-2): ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	408.199	3	136.066	.397	.761[b]
	Residual	2058.554	6	343.092		
	Total	2466.753	9			

a. Dependent Variable: Gross Profit Margin 2015

b. Predictors: (Constant), Debt Asset Ratio2015, Interest Cover Ratio 2015, Debt Equity Ratio 2015

The ANOVA table shows the p-value of 0.761 which is more than 0.05 which shows the model is not significant in case of GPM for the year 2015.

Table 6.1(1b-3): Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	33.768	14.818		2.279	.063
	Debt Equity Ratio 2015	-.315	1.685	-.119	-.187	.858
	Interest Cover Ratio 2015	.450	1.286	.157	.350	.738
	Debt Asset Ratio 2015	-15.041	52.953	-.202	-.284	.786

a. Dependent Variable: Gross Profit Margin 2015

The coefficient table shows the formation of regression equation as

$GPM=\beta_0+ \beta_1*DER+\beta_2*ICR+\beta_3*DAR+ e$

Where,

β_0 = Intercept

β_1, β_2, and β_3 = Coefficient of the Independent variable

DER = Debt Equity ratio

TADR = Debt to Asset ratio

ICR = Interest coverage ratio

e = Error term

The coefficient table indicates that the intercept is 33.768 i.e. when all the factors are equated to zero the GPM will be 34.637. While the other Coefficients will be β_1**=-0.315,** β_2**=0.450** and β_3**=-15.041.** This states that an increase in the level of DER will bring about 0.315 times decrease in GPM and it also states that DER will have the least impact on GPM among the three independent variables. Further it can be said that an increase in ICR will bring about 0.450 times increase in GPM and is the only factor which will affect GPM positively. Whereas an increase in DAR will cause a drastic impact on GPM as it will decrease by 15.041 times. This shows that DAR is having the most impact on GPM.

2) Net Profit Margin (Dependent Variable-2)

a) Correlation Analysis:

Table 6.1(2a): Correlations

		Net Profit Margin 2015	Debt Equity Ratio 2015	Interest Cover Ratio 2015	Debt Asset Ratio 2015
Pearson Correlation	Net Profit Margin 2015	1.000	-.814	.454	-.850
	Debt Equity Ratio 2015	-.814	1.000	-.348	.806
	Interest Cover Ratio 2015	.454	-.348	1.000	-.537
	Debt Asset Ratio 2015	-.850	.806	-.537	1.000
Sig. (1-tailed)	Net Profit Margin 2015	.	.002	.094	.001
	Debt Equity Ratio 2015	.002	.	.162	.002
	Interest Cover Ratio 2015	.094	.162	.	.055
	Debt Asset Ratio 2015	.001	.002	.055	.
N	Net Profit Margin 2015	10	10	10	10
	Debt Equity Ratio 2015	10	10	10	10
	Interest Cover Ratio 2015	10	10	10	10
	Debt Asset Ratio 2015	10	10	10	10

The correlation table states that there is very high degree of negative correlation between NPM and Debt Equity Ratio and Debt to Asset Ratio which signifies that with increase in Debt Equity Ratio and Debt to Asset ratio the NPM level will decline because of use of more debt which will result into increase in interest expenses. The interest coverage ratio shows a positive correlation of .454 with NPM which signifies with increase in ICR the NPM will also increase as more interest payment will be done on account of increased profit.

b) Regression Analysis

Table 6.1(2b-1): Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.878[a]	.771	.657	9.18842

a. Predictors: (Constant), Debt Asset Ratio 2015, Interest Cover Ratio 2015, Debt Equity Ratio 2015

The Model Summary table shows the impact of all the independent factors on the dependent factor. The R square value shows that NPM is affected 77.1% by capital structure and 22.9 by other factors like liquidity, investment and working capital decisions.

Table 6.1(2b-2): ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1708.372	3	569.457	6.745	.024[b]
	Residual	506.563	6	84.427		
	Total	2214.934	9			

a. Dependent Variable: Net Profit Margin 2015

b. Predictors: (Constant), Debt Asset Ratio 2015, Interest Cover Ratio 2015, Debt Equity Ratio 2015

The ANOVA table shows the p-value of .024 which is less than 0.05 which shows the model is significant.

Table 6.1(2b-3): Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	10.766	7.350		1.465	.193
	Debt Equity Ratio 2015	-.942	.836	-.377	-1.127	.303
	Interest Cover Ratio 2015	.112	.638	.041	.175	.867
	Debt Asset Ratio 2015	-37.002	26.268	-.524	-1.409	.209

a. Dependent Variable: Net Profit Margin 2015

The coefficient table shows the formation of regression equation as

$NPM=\beta_0+ \beta_1*DER+\beta_2*ICR+\beta_3*DAR+ e$

Where,

β_0 = Intercept

β_1, β_2, and β_3 = Coefficient of the Independent variable

DER = Debt Equity ratio

DAR = Debt to Asset ratio

ICR = Interest coverage ratio

e = Error term

The coefficient table indicates that the intercept is 10.766 i.e. when all the factors are equated to zero the NPM will be 10.766. While the other Coefficients will be β_1**=-0.942,** β_2**=0.112** and β_3**=-37.002.** This states that an increase in the level of DER will bring about 0.942 times decrease in NPM. Further it can be said that an increase in ICR will bring about 0.112 times increase in NPM and is the only factor which will affect NPM positively and it also states that ICR will have the least impact on NPM among the three independent variables. Whereas an increase in DAR will cause a drastic impact on NPM as it will decrease by 37.002 times. This shows that DAR is having the most impact on NPM.

3) Return on Capital Employed (Dependent Variable-3)

a) Correlation Analysis

Table 6.1(3a): Correlations

		ROCE 2015	Debt Equity Ratio 2015	Interest Cover Ratio 2015	Debt Asset Ratio 2015
Pearson Correlation	ROCE 2015	1.000	-.719	.531	-.683
	Debt Equity Ratio 2015	-.719	1.000	-.348	.806
	Interest Cover Ratio 2015	.531	-.348	1.000	-.537
	Debt Asset Ratio 2015	-.683	.806	-.537	1.000
Sig. (1-tailed)	ROCE 2015	.	.010	.057	.015
	Debt Equity Ratio 2015	.010	.	.162	.002
	Interest Cover Ratio 2015	.057	.162	.	.055
	Debt Asset Ratio 2015	.015	.002	.055	.
N	ROCE 2015	10	10	10	10
	Debt Equity Ratio 2015	10	10	10	10
	Interest Cover Ratio 2015	10	10	10	10
	Debt Asset Ratio 2015	10	10	10	10

The Correlation table shows that there is a high negative correlation between DER, DAR and ROCE which means with the increase in DER or DAR the ROCE will decrease on account of increased expense which will lead to decrease in profits. The table shows that ICR is having a moderate positive correlation with ROCE which means that with increase in ICR the GPM will also increase on account of increased revenue.

b) Regression Analysis

Table 6.1(3b-1): Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.780[a]	.608	.412	2.46449

a. Predictors: (Constant), Debt Asset Ratio 2015, Interest Cover Ratio 2015, Debt Equity Ratio 2015

Table 6.1(3b-2): ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	56.457	3	18.819	3.098	.111[b]
	Residual	36.442	6	6.074		
	Total	92.900	9			

a. Dependent Variable: ROCE 2015

The R square value in the table shows that ROCE is affected 60.8 % by capital structure and 39.2 % by other internal and external factors like market conditions, demand and supply, government policies, liquidity, investment and working capital decisions.

The ANOVA table shows the p-value of .111 which is more than 0.05 which shows the model is not significant.

Table 6.1(3b-3): Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.597	1.972		2.331	.059
	Debt Equity Ratio 2015	-.283	.224	-.553	-1.260	.254
	Interest Cover Ratio 2015	.165	.171	.296	.964	.372
	Debt Asset Ratio 2015	-1.128	7.046	-.078	-.160	.878

a. Dependent Variable: ROCE 2015

b. Predictors: (Constant), Debt Asset Ratio 2015, Interest Cover Ratio 2015, Debt Equity Ratio 2015

The Coefficient table shows the formation of regression equation as

$ROCE=\beta_0+ \beta_1*DER+\beta_2*ICR+\beta_3*DAR+ e$

Where,

β_0 = Intercept

β_1, β_2, and β_3= Coefficient of the Independent variable

DER = Debt Equity ratio

TADR = Debt to Asset ratio

ICR = Interest coverage ratio

e = Error term

The Coefficient table indicates that the intercept is 4.597 i.e. when all the factors are equated to zero the ROCE will be 4.597. While the other Coefficients will be **β_1= -0.283, β_2=0.165** and **β_3= -1.128.** This states that an increase in the level of DER will bring about 0.283 times decrease in ROCE. Further it can be said that an increase in ICR will bring about 0.165 times increase in ROCE and is the only factor which will affect ROCE positively and it also states that ICR will have the least impact on ROCE among the three independent variables. Whereas an increase in DAR will cause a significant decrease in ROCE as it will decrease by 1.128 times. This shows that DAR is having the most impact on ROCE.

6.2. Analysis for the Year 2016

1) Gross Profit Margin (Dependent Variable-1)

a) Correlation Analysis

Table 6.2(1a): Correlations

		Gross Profit Margin 2016	Debt Equity Ratio 2016	Interest Coverage Ratio 2016	Debt Asset Ratio 2016
Pearson Correlation	Gross Profit Margin 2016	1.000	-.022	.383	-.297
	Debt Equity Ratio 2016	-.022	1.000	-.112	.260
	Interest Coverage Ratio 2016	.383	-.112	1.000	-.505
	Debt Asset Ratio 2016	-.297	.260	-.505	1.000
Sig. (1-tailed)	Gross Profit Margin 2016	.	.476	.137	.203
	Debt Equity Ratio 2016	.476	.	.379	.234
	Interest Coverage Ratio 2016	.137	.379	.	.068
	Debt Asset Ratio 2016	.203	.234	.068	.
N	Gross Profit Margin 2016	10	10	10	10
	Debt Equity Ratio 2016	10	10	10	10
	Interest Coverage Ratio 2016	10	10	10	10
	Debt Asset Ratio 2016	10	10	10	10

The Correlation table shows that there is a weak negative correlation between DER, DAR and GPM which means with the increase in DER or DAR the GPM will decrease on account of increased production which will lead to increase in COGS. The table shows that ICR is having a moderate positive correlation with GPM which means that with increase in ICR the GPM will also increase on account of increased revenue.

b) Regression Analysis

Table 6.2(1b-1): Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.405[a]	.164	-.254	18.44105

a. Predictors: (Constant), Debt Asset Ratio 2016, Debt Equity Ratio 2016, Interest Coverage Ratio 2016

The Model Summary table shows the impact of all the independent factors on the dependent factor which is measured by r square.

The R square value in the table shows that GPM is affected only 16.4% by capital structure and 83.6 % by other internal and external factors like market conditions, demand and supply, government policies, liquidity, investment and working capital decisions.

The ANOVA table shows the p-value of 0.764 which is more than 0.05 which shows the model is not significant in case of GPM for the year 2016.

Table 6.2(1b-2): ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	399.526	3	133.175	.392	.764[b]
	Residual	2040.433	6	340.072		
	Total	2439.959	9			

a. Dependent Variable: Gross Profit Margin 2016

b. Predictors: (Constant), Debt Asset Ratio 2016, Debt Equity Ratio 2016, Interest Coverage Ratio 2016

Table 6.2(1b-3): Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	34.637	13.230		2.618	.040
	Debt Equity Ratio 2016	.227	1.662	.053	.137	.896
	Interest Coverage Ratio 2016	.760	1.054	.312	.721	.498
	Debt Asset Ratio 2016	-12.838	37.406	-.153	-.343	.743

a. Dependent Variable: Gross Profit Margin 2016

The Coefficient table shows the formation of regression equation as

$GPM=\beta_0+ \beta_1*DER+\beta_2*ICR+\beta_3*DAR+ e$

Where,

β_0 = Intercept

β_1, β_2, and β_3= Coefficient of the Independent variable

DER = Debt Equity ratio

TADR = Debt to Asset ratio

ICR = Interest coverage ratio

e = Error term

The Coefficient table indicates that the intercept is 34.637 i.e. when all the factors are equated to zero the GPM will be 34.637. While the other Coefficients will be **β_1= -0.227, β_2=0.760** and **β_3= -12.838.** This states that an increase in the level of DER will bring about 0.227 times decrease in GPM. Further it can be said that an increase in ICR will bring about 0.760 times increase in GPM and is the only factor which will affect GPM positively. Whereas an increase in DAR will cause a significant decrease in GPM as it will decrease by 12.838 times. This shows that DAR is having the most impact on GPM.

2) Net Profit Margin (Dependent Variable-2)

a) Correlation Analysis

Table 6.2(2a-1): Correlations

		Net Profit Margin 2016	Debt Equity Ratio 2016	Interest Coverage Ratio 2016	Debt Asset Ratio 2016
Pearson Correlation	Net Profit Margin 2016	1.000	.300	.511	-.741
	Debt Equity Ratio 2016	.300	1.000	-.112	.260
	Interest Coverage Ratio 2016	.511	-.112	1.000	-.505
	Debt Asset Ratio 2016	-.741	.260	-.505	1.000
Sig. (1-tailed)	Net Profit Margin 2016	.	.200	.066	.007
	Debt Equity Ratio 2016	.200	.	.379	.234
	Interest Coverage Ratio 2016	.066	.379	.	.068
	Debt Asset Ratio 2016	.007	.234	.068	.
N	Net Profit Margin 2016	10	10	10	10
	Debt Equity Ratio 2016	10	10	10	10
	Interest Coverage Ratio 2016	10	10	10	10
	Debt Asset Ratio 2016	10	10	10	10

The Correlation table states that there is very high degree of negative correlation between NPM and Debt to Asset Ratio which signifies that with increase in Debt to Asset ratio the NPM level will decline because of use of more debt which will result into increase in interest expenses. The interest coverage ratio shows a positive correlation of .511 with NPM which signifies with increase in ICR the NPM will also increase as more interest payment will be done on account of increased profit.

b) Regression Analysis

Table 6.2(2b-1): Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.911[a]	.830	.745	10.28099

a. Predictors: (Constant), Debt Asset Ratio 2016, Debt Equity Ratio 2016, Interest Coverage Ratio 2016

The Model Summary table shows the impact of all the independent factors on the dependent factor.

The R square value shows that NPM is affected 83% by capital structure and 17% by other factors like liquidity, investment and working capital decisions.

Table 6.2(2b-2): ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	3093.276	3	1031.092	9.755	.010[b]
	Residual	634.193	6	105.699		
	Total	3727.469	9			

a. Dependent Variable: Net Profit Margin 2016

b. Predictors: (Constant), Debt Asset Ratio 2016, Debt Equity Ratio 2016, Interest Coverage Ratio 2016

The ANOVA table shows the p-value of .010 which is less than 0.05 which shows the model is significant.

Table 6.2(2b-3): Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	10.202	7.376		1.383	.216
	Debt Equity Ratio 2016	2.784	.927	.524	3.005	.024
	Interest Coverage Ratio 2016	.511	.588	.170	.870	.418
	Debt Asset Ratio 2016	-82.163	20.854	-.791	-3.940	.008

a. Dependent Variable: Net Profit Margin 2016

The Coefficient table shows the formation of regression equation as

$NPM=\beta_0+ \beta_1*DER+\beta_2*ICR+\beta_3*DAR+ e$

Where,

β_0 = Intercept

β_1, β_2, and β_3 = Coefficient of the Independent variable

DER = Debt Equity ratio

TADR = Debt to Asset ratio

ICR = Interest coverage ratio

e = Error term

The Coefficient table indicates that the intercept is 10.202 i.e. when all the factors are equated to zero the NPM will be 10.202. While the other Coefficients will be β_1**=-2.784,** β_2**=0.511** and β_3**=-82.163.** This states that an increase in the level of DER will bring about 2.784 times decrease in NPM. Further it can be said that an increase in ICR will bring about 0.511 times increase in NPM and is the only factor which will affect NPM positively and it also states that ICR will have the least impact on NPM among the three independent variables. Whereas an increase in DAR will cause a drastic impact on NPM as it will decrease by 82.163 times. This shows that DAR is having the most impact on NPM.

3) Return On Capital Employed (Dependent Variable-3)

a) Correlation Analysis

Table 6.2(3a): Correlations

		ROCE 2016	Debt Equity Ratio 2016	Interest Coverage Ratio 2016	Debt Asset Ratio 2016
Pearson Correlation	ROCE2016	1.000	-.016	.704	-.484
	Debt Equity Ratio 2016	-.016	1.000	-.112	.260
	Interest Coverage Ratio 2016	.704	-.112	1.000	-.505
	Debt Asset Ratio 2016	-.484	.260	-.505	1.000
Sig. (1-tailed)	ROCE 2016	.	.482	.011	.078
	Debt Equity Ratio 2016	.482	.	.379	.234
	Interest Coverage Ratio 2016	.011	.379	.	.068
	Debt Asset Ratio 2016	.078	.234	.068	.
N	ROCE 2016	10	10	10	10
	Debt Equity Ratio 2016	10	10	10	10
	Interest Coverage Ratio 2016	10	10	10	10
	Debt Asset Ratio 2016	10	10	10	10

The Correlation table shows that there is a weak negative correlation between DER, DAR and ROCE which means with the increase in DER or DAR the ROCE will decrease on account of increased expenses which will lead to decrease in profits. The table shows that ICR is having a moderate positive correlation with ROCE which means that with increase in ICR the ROCE will also increase on account of increased revenue.

b) Regression Analysis

Table 6.2(3b-1): Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.727[a]	.528	.293	3.99966

a. Predictors: (Constant), Debt Asset Ratio 2016, Debt Equity Ratio 2016, Interest Coverage Ratio 2016

The R square value in the table shows that ROCE is affected 52.8 % by capital structure and 47.2 % by other internal and external factors like market conditions, demand and supply, government policies, liquidity, investment and working capital decisions.

Table 6.2(3b-2): ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	107.569	3	35.856	2.241	.184[b]
	Residual	95.983	6	15.997		
	Total	203.552	9			

a. Dependent Variable: ROCE 2016

b. Predictors: (Constant), Debt Asset Ratio 2016, Debt Equity Ratio 2016, Interest Coverage Ratio 2016

The ANOVA table shows the p-value of .111 which is more than 0.05 which shows the model is not significant.

Table 6.2(3b-3): Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.111	2.869		.736	.490
	Debt Equity Ratio 2016	.130	.361	.105	.361	.730
	Interest Coverage Ratio 2016	.433	.229	.615	1.892	.107
	Debt Asset Ratio 2016	-4.875	8.113	-.201	-.601	.570

a. Dependent Variable: ROCE 2016

The Coefficient table shows the formation of regression equation as

$ROCE=\beta_0+\beta_1*DER+\beta_2*ICR+\beta_3*DAR+e$

Where,

β_0 = Intercept

β_1, β_2, and β_3 = Coefficient of the Independent variable

DER = Debt Equity ratio

TADR = Debt to Asset ratio

ICR = Interest coverage ratio

e = Error term

The Coefficient table indicates that the intercept is 2.111 i.e. when all the factors are equated to zero the ROCE will be 2.111. While the other Coefficients will be β_1= **0.130,** β_2=**0.433** and β_3= **-4.875.** This states that an increase in the level of DER will bring about 0.130 times increase in ROCE. Further it can be said that an increase in ICR will bring about 0.433 times increase in ROCE. Whereas an increase in DAR will cause a significant decrease in ROCE as it will decrease by 4.875 times. This shows that DAR is having the most impact on ROCE.

6.3. Analysis for the Combined Year 2015 & 2016

1) Gross Profit Margin (Dependent Variable-1)

a) Correlation Analysis

Table 6.3(1a): Correlations

		Mean GPM	Mean DER	Mean ICR	Mean DAR
Pearson Correlation	Mean GPM	1.000	-.438	.348	-.353
	Mean DER	-.438	1.000	-.362	.928
	Mean ICR	.348	-.362	1.000	-.517
	Mean DAR	-.353	.928	-.517	1.000
Sig. (1-tailed)	Mean GPM	.	.103	.163	.158
	Mean DER	.103	.	.152	.000
	Mean ICR	.163	.152	.	.063
	Mean DAR	.158	.000	.063	.
N	Mean GPM	10	10	10	10
	Mean DER	10	10	10	10
	Mean ICR	10	10	10	10
	Mean DAR	10	10	10	10

The correlation table shows that there is a moderate negative correlation between DER, DAR and GPM which means with the increase in DER or DAR the GPM will decrease on account of increased production which will lead to increase in COGS. The table shows that ICR is having a moderate positive correlation with GPM which means that with increase in ICR the GPM will also increase on account of increased revenue.

b) Regression Analysis

Table 6.3(1b-1): Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.564[a]	.318	-.022	16.34952

a. Predictors: (Constant), Mean DAR, Mean ICR, Mean DER

The R square value in the table shows that GPM is affected only 31.8% by capital structure and 68.2 % by other internal and external factors like market conditions, demand and supply, government policies, liquidity, investment and working capital decisions.

Table 6.3(1b-2): ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	749.499	3	249.833	.935	.480[b]
	Residual	1603.841	6	267.307		
	Total	2353.340	9			

a. Dependent Variable: Mean GPM

b. Predictors: (Constant), Mean DAR, Mean ICR, Mean DER

The ANOVA table shows the p-value of 0.480 which is more than 0.05 which shows the model is not significant in case of GPM.

Table 6.3(1b-3): Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	20.747	16.892		1.228	.265
	MeanDER	-5.491	4.677	-1.144	-1.174	.285
	MeanICR	1.064	1.104	.408	.964	.372
	MeanDAR	71.626	82.636	.919	.867	.419

a. Dependent Variable: Mean GPM

The coefficient table shows the formation of regression equation as

$GPM=\beta_0+ \beta_1*DER+\beta_2*ICR+\beta_3*DAR+ e$

Where,

β_0 = Intercept

β_1, β_2, and β_3= Coefficient of the Independent variable

DER = Debt Equity ratio

TADR = Debt to Asset ratio

ICR = Interest coverage ratio

e = Error term

The coefficient table indicates that the intercept is 20.747 i.e. when all the factors are equated to zero the GPM will be 20.747. While the other Coefficients will be β_1**= -5.491,** β_2**=1.064** and β_3**= 71.626.** This states that an increase in the level of DER will bring about 5.491 times decrease in GPM. Further it can be said that an increase in ICR will bring about 1.064 times increase in GPM. Whereas an increase in DAR will cause a significant increase in GPM as it will increase by 71.626 times. This shows that DAR is having the most impact on GPM.

2) Net Profit Margin (Dependent Variable-2)

a) Correlation Analysis

Table 6.3(2a): Correlations

		Mean NPM	Mean DER	Mean ICR	Mean DAR
Pearson Correlation	Mean NPM	1.000	-.850	.507	-.824
	Mean DER	-.850	1.000	-.362	.928
	Mean ICR	.507	-.362	1.000	-.517
	Mean DAR	-.824	.928	-.517	1.000
Sig. (1-tailed)	Mean NPM	.	.001	.067	.002
	Mean DER	.001	.	.152	.000
	Mean ICR	.067	.152	.	.063
	Mean DAR	.002	.000	.063	.
N	Mean NPM	10	10	10	10
	Mean DER	10	10	10	10
	Mean ICR	10	10	10	10
	Mean DAR	10	10	10	10

The Correlation table states that there is very high degree of negative correlation between NPM and Debt Equity Ratio and Debt to Asset Ratio which signifies that with increase in Debt Equity Ratio and Debt to Asset ratio the NPM level will decline because of use of more debt which will result into increase in interest expenses. The interest coverage ratio shows a positive correlation of .507 with NPM which signifies that with increase in ICR the NPM will also increase as more interest payment will be done on account of increased profit.

b) Regression Analysis

Table 6.3(2b-1): Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.877[a]	.769	.653	9.83576

a. Predictors: (Constant), Mean DAR, Mean ICR, Mean DER

The R square value shows that NPM is affected 76.9% by capital structure and 23.1% by other factors like liquidity, investment and working capital decisions.

Table 6.3(2b-2): ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1927.995	3	642.665	6.643	.025[b]
	Residual	580.453	6	96.742		
	Total	2508.448	9			

a. Dependent Variable: Mean NPM

b. Predictors: (Constant), Mean DAR, Mean ICR, Mean DER

The ANOVA table shows the p-value of .025 which is less than 0.05 which shows the model is significant.

Table 6.3(2b-3): Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.369	10.162		.036	.972
	Mean DER	-4.056	2.813	-.818	-1.442	.199
	Mean ICR	.649	.664	.241	.978	.366
	Mean DAR	4.800	49.713	.060	.097	.926

a. Dependent Variable: Mean NPM

The Coefficient table shows the formation of regression equation as

$GPM=\beta_0+ \beta_1*DER+\beta_2*ICR+\beta_3*DAR+ e$

Where,

β_0 = Intercept

β_1, β_2, and β_3 = Coefficient of the Independent variable

DER = Debt Equity ratio

TADR = Debt to Asset ratio

ICR = Interest coverage ratio

e = Error term

The Coefficient table indicates that the intercept is 0.369 i.e. when all the factors are equated to zero the NPM will be 0.369. While the other Coefficients will be β_1**=-4.056,** β_2**=0.649** and β_3**=4.800.** This states that an increase in the level of DER will bring about 4.056 times decrease in NPM. Further it can be said that an increase in ICR will bring about 0.649 times increase in NPM and it also shows that ICR will have the least impact on NPM among the three independent variables. Whereas an increase in DAR will cause a positive impact on NPM as it will increase by 4.800 times. This shows that DAR is having the most impact on NPM.

3) Return on Capital Employed (Dependent Variable-3)

a) Correlation Analysis

Table 6.3(3a): Correlations

		Mean ROCE	Mean DER	Mean ICR	Mean DAR
Pearson Correlation	Mean ROCE	1.000	-.619	.635	-.579
	Mean DER	-.619	1.000	-.362	.928
	Mean ICR	.635	-.362	1.000	-.517
	Mean DAR	-.579	.928	-.517	1.000
Sig. (1-tailed)	Mean ROCE	.	.028	.024	.040
	Mean DER	.028	.	.152	.000
	Mean ICR	.024	.152	.	.063
	Mean DAR	.040	.000	.063	.
N	Mean ROCE	10	10	10	10
	Mean DER	10	10	10	10
	Mean ICR	10	10	10	10
	Mean DAR	10	10	10	10

The Correlation table shows that there is a high negative correlation between DER, DAR and ROCE which means with the increase in DER or DAR the ROCE will decrease on account of increased expenses which will lead to increase in profits. The table shows that ICR is having a moderate positive correlation with ROCE which means that with increase in ICR the ROCE will also increase on account of increased revenue.

b) Regression Analysis

Table 6.3(3b-1): Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.801[a]	.641	.461	2.76612

a. Predictors: (Constant), Mean DAR, Mean ICR, Mean DER

The R square value in the table shows that ROCE is affected 64.1 % by capital structure and 35.9 % by other internal and external factors like market conditions, demand and supply, government policies, liquidity, investment and working capital decisions.

Table 6.3(3b-2): ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	81.935	3	27.312	3.569	.086[b]
	Residual	45.908	6	7.651		
	Total	127.843	9			

a. Dependent Variable: Mean ROCE

b. Predictors: (Constant), Mean DAR, Mean ICR, Mean DER

The ANOVA table shows the p-value of .111 which is more than 0.05 which shows the model is not significant.

Table 6.3(3b-3): Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.582	2.858		.204	.845
	Mean DER	-1.262	.791	-1.128	-1.596	.162
	Mean ICR	.388	.187	.638	2.077	.083
	Mean DAR	14.498	13.981	.798	1.037	.340

a. Dependent Variable: Mean ROCE

The Coefficient table shows the formation of regression equation as

$ROCE=\beta_0+ \beta_1*DER+\beta_2*ICR+\beta_3*DAR+ e$

Where,

β_0 = Intercept

β_1, β_2, and β_3= Coefficient of the Independent variable

DER = Debt Equity ratio

TADR = Debt to Asset ratio

ICR = Interest coverage ratio

e = Error term

The Coefficient table indicates that the intercept is 0.582 i.e. when all the factors are equated to zero the ROCE will be 0.582. While the other Coefficients will be β_1**= -1.262,** β_2**=0.388**and β_3**= 14.498.** This states that an increase in the level of DER will bring about 1.262 times decrease in ROCE. Further it can be said that an increase in ICR will bring about 0.388 times increase in ROCE. Whereas an increase in DAR will cause a significant increase in ROCE as it will increase by 14.498 times. This shows that DAR is having the most impact on ROCE.

7. SCOPE FOR FURTHER STUDY

The research can be further carried out on the entire Indian Steel Industry and also for a period of more than 2 years as the result of the study shows that the impact of capital structure on financial performance is more for both the years (2015 and 2016) as compared to individual years separately

8. CONCLUSION

This paper examined capital structure and its impact on financial performance of Top 10 Steel

companies. The Correlation results confirmed that their exits a negative relationship between GPM, NPM and ROCE with DER and DAR and positive relationship between GPM, NPM and ROCE and ICR. Therefore, overall we can conclude that there is negative relationship between capital structure and financial performance of Indian Steel Industry.

The R square results show the effect of capital structure factors on financial performance of top 10 steel companies. The analysis result depicts that 31.8% of GPM, 76.9% of NPM and 64.1% of ROCE is affected by capital structure factors and the overall impact on financial indicators is approximately 60%by capital structure factors.

The result of ANOVA indicated that there is a significant impact of capital structure on NPM and ROCE but not on GPM while the result of multiple regression analysis shows that the model is not significant for period of one year and two years as the p-value is greater than the significance level of 5%. Thus we can conclude that capital structure has an impact on financial performance of the Top 10 Indian steel companies but capital structure alone does not impact the financial performance as the results shows that its impact fluctuates with the year 2015, 2016 and also for both the years combined together.

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