

## **The Impact of Capital Structure on Profitability of Listed Indian Infrastructure Companies**

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**Abstract:** *The competition among Infrastructure Companies in India has been growing rapidly due to excellent opportunities with expansion of roads and highways, ports and airports, railways and power. The growth of Infrastructure Companies leverages country's development leading to futuristic/ smart cities and townships enhancing quality of living and increasing efficiency of resource-utilization.*

*The motives of this paper are: (i) to study capital structure of the Infrastructure Companies; (ii) to study the impact of capital structure decision on company's overall value.*

*The population of this research is Infrastructure Companies listed in Indian Stock Exchange. The study provides a mixed result on relation between capital structure and performance of the firm. The analysis of data is done on the basis of Ratio Analysis and Correlation Matrix.*

**Keywords:** *Infrastructure, Capital Structure, Profitability, Stock Markets*

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### **I. Introduction**

Capital Structure refers to balance between equities and long term liabilities and it sets the firm's leverage. Leverage, in turn, determines how owners and creditors share risks and rewards in proportion to their share of company funding.

For a massive country such as India, improvement in infrastructure is a necessity.

Following several initiatives such as 'Housing for All' and 'Smart Cities,' the government has been working on reducing the bottlenecks that impede growth in the infrastructure sector. The latest budgetary outlay for infrastructure spending has been increased to Rs3.96 lakh crore for various projects including housing, railways, ports and irrigation.

The infrastructure industry is not limited to the construction of roads but also encompasses roads, railways, power, water supply, airways to telecommunications, oil and gas, and so on, the growth potential is immense. Furthermore, infrastructure companies have been deleveraging, which means much of their balance sheets have been cleaned up and now look healthier and in a much better shape, empowering them to take on new projects.

Infra-support sectors too, stand a chance to gain as the demand increases. Even though market participants have started to realize the potential held by the infra segment, due to its chequered past of excessive leverage, stalled execution and over-expansion, infrastructure companies fail to command high valuations. Hence, they have a better risk-adjusted-return profile.

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The purpose of this paper is to focus on how debt-equity mix influence on performance of infrastructure companies. An attempt has been made to analyse the help of ratios related to capital structure for last ten years financial data of leading ten infrastructure companies.

### **II. Literature Review**

#### **Theories of Capital Structure:**

Capital Structure Theories are the most important area of Finance.

As Modigliani and Miller, with their article in 1958, generated many controversies that resulted in comparing their theory to the real world situations.

He proposed that, changes in capital structure has no long-term effect on the value of the firm and that the value of the firm is independent of its bond/stock financing mix.

MM posted their arguments as Proposition I and Proposition II. Proposition I states market value of any firm is independent of amount debt or equity in capital structure. Proposition II states the cost of equity is directly related and incremental to the percentage of debt in capital structure.

After Modigliani-Miller article, David Durant had published the costs of debt and equity funds for business in 'The Management of Corporate Capital (ed., 1959). There he introduced two approaches: the Net Income Approach and the Net Operating Income Approach.

**a.** Under the net income (NI) approach, the cost of debt and cost of equity are assumed to be independent of the capital structure i.e. the value of a firm is not affected by the change of debt component in the capital structure.

This approach says that since debt is a cheaper source of fund, it can be used effectively to increase the value of the firm by decreasing the overall cost of capital. In essence, change in the degree of leverage will have an impact on the capital structure.

**b.** Under the net operating income (NOI) approach, the cost of equity is assumed to increase linearly with average. This approach states the irrelevance of capital structure in calculating the value of the firm. The cost of capital for the firm will always be the same. No matter what the degree of leverage is, the total value of the firm will remain constant.

Trade-off theory of capital structure allows bankruptcy cost to exist as an offset to the benefit of using debt as tax shield. It states that there is an advantage to financing with debt, namely, the tax benefits of debt and that there is a cost of financing with debt the bankruptcy costs and the financial distress costs of debt.

Pecking order theory maintains that businesses adhere to a hierarchy of financing sources and prefer internal financing when available, and debt is preferred over equity if external financing is required. Thus, the form of debt a firm chooses can act as a signal of its need for external finance.

## **2. Other Studies:**

Assad N. (2016-Global Journal of Management and Business Research) investigated on 30 firms of FTSE-100 index of London Stock Exchange to explore the effect of capital structure on firms profitability. The data period for the study was 2005 to 2014. The study concluded that higher the value of debt, higher will be the tax benefits received by firms. Hence the firm should maintain optimum level of capital structure in order to achieve the targeted level of efficiency in business.

Mr. Bhushan Singh & Dr. Mohinder Singh (2016) focused on listed Cement Companies in India for the period 2009 to 2014. Based on correlation coefficient, it was found that there was a negative relationship between debt and profitability i.e. companies with higher proportion of debt tend to have low profitability.

Also, it was found that the firms under consideration did not had sound debt-equity composition in their capital structure and hence failed to enjoy benefits of leverage properly.

Ata Takeh and Dr. Jubily Navaprabha did a study on Capital structure and its impact on financial performance of selected Indian Steel Industry during 2007 to 2012. The result showed that there was a negative relationship between capital structure and financial performance of Indian Steel Industry. The multiple regression and ANOVA indicated that there is a significant impact of capital structure on OPM, ROCE, ROE and there is no significant impact of capital structure on ROA.

Nilesh P. Movalia did a study on Capital Structure Analysis and Profitability of Indian Tyres Industry for all the listed companies in BSE and NSE for the period 2009-10 to 2013-14. The paper concluded that there was significant relation between capital structure (Debt-Equity Ratio) on profitability (Net Profit Ratio, ROI, ROCE) of tyre companies in India. If company maintains ideal capital structure it helps to generate more profit and vice versa.

## **III. Research Methodology**

### **a). Data Collection**

The study is mainly based on secondary data. Relevant secondary data have been collected from Companies Balance Sheets, BSE & NSE websites, financial reports of Infrastructural companies.

### **b). Sample size and Sampling Method**

There are 34 listed Infrastructure - General companies in India. The study covers only 9 major infrastructural companies. Keeping in view the scope of the study, the analysis is done for the period 2007 to 2017.

Due to some constraints in the study, such as non-availability of financial statements, it is compelled to restrict the sample study to 9 companies.

Hence, the companies are selected on the basis of their listing in Bombay and National Stock Exchange as on 2017 on the basis of their market capitalisation.

Following is the list of companies: Table 1

Company Name	Market Cap (Rs. cr)
Larsen & Toubro	1,58,933.91
Adani Ports	84,277.38
BHEL	31,849.40
Thermax	11,584.38
GMR Infra	10,412.01
IRB Infra	7,441.95
BEML	7,171.60
Sadbhav Engg	4,736.21
Jaiprakash Asso	4,585.18

### Objectives

- Study relationship between capital structure and profitability of Infrastructural companies.
- Study the relationship between Debt/Equity ratio with Return on Capital Employed, Return on Net worth / Equity, Return on Asset and Interest Coverage Ratio.

Following are the propositions (P) framed for the present study.

- P<sub>1</sub> : There exist a relationship between Debt/Equity and Return on Capital Employed.
- P<sub>2</sub> : There exist a relationship between Debt/Equity and Return on Net worth / Equity.
- P<sub>3</sub> : There exist a relationship between Debt/Equity and Return on Assets.
- P<sub>4</sub> : There exist a relationship between Debt/Equity and Return on Interest Coverage Ratio.

### Limitations

- It studies the data of only one specific industry of developing economy.
- It includes only nine Infrastructural Companies for 10 years, hence the findings of this study may not be true for the industry taken.
- The study is done on secondary data and hence the findings may not be reliable.
- The study covers only the listed companies in stock exchange of India.

## IV. Results And Discussions

Table 2

Debt Equity Ratio (times)		
Company Name	Mean	SD
Jaiprakash Asso	4.51	1.49
GMR Infra	4.28	2.58
Sadbhav Engg	4.13	2.45
IRB Infra	2.16	0.62
Larsen & Toubro	1.58	0.41
Adani Ports	1.45	0.75
BEML	0.35	0.13
Thermax	0.13	0.12
BHEL	0.04	0.05

Table 3

Return on Capital Employed (%)		
Company Name	Mean	SD
Thermax	17.14	10.08
BHEL	12.44	10.43
Adani Ports	8.70	2.73
Larsen & Toubro	7.99	4.41
BEML	4.69	5.70
IRB Infra	4.23	2.30
Sadbhav Engg	1.57	2.29
GMR Infra	-0.75	2.81
Jaiprakash Asso	-1.96	9.10

Table 4

Return on Equity (%)		
Company Name	Mean	SD
Adani Ports	19.79	4.96
Thermax	19.42	10.21
Larsen & Toubro	17.21	5.84
BHEL	16.07	12.72
IRB Infra	14.12	3.85
BEML	5.07	6.04
Sadbhav Engg	4.45	9.13
GMR Infra	-9.97	22.00
Jaiprakash Asso	-20.44	74.48

Table 5

Return on Asset (%)		
Company Name	Mean	SD
Thermax	7.14	3.73
Adani Ports	6.95	1.89
BHEL	5.83	4.43
Larsen & Toubro	4.28	1.88
IRB Infra	3.54	1.87
BEML	2.45	2.84
Sadbhav Engg	1.15	1.74
GMR Infra	-0.51	2.11
Jaiprakash Asso	-0.78	5.19

Table 6

Interest Coverage Ratio (%)		
Company Name	Mean	SD
Thermax	86.35	89.73
BHEL	85.48	87.75
Larsen & Toubro	5.70	2.05

BEML	4.53	4.82
Adani Ports	4.18	1.20
IRB Infra	2.12	0.37
Sadbhav Engg	1.51	0.89
Jaiprakash Asso	1.46	1.01
GMR Infra	1.28	1.06

**Table 2:** Debt Equity Ratio

This table depicts that among all the infrastructural companies Jaiprakash Associates, GMR Infrastructure and Sadbhav Engineering are highly leveraged companies having highest debt to equity ratio i.e. 4.51, 4.28 and 4.13 respectively. On the other hand BEML, Thermax and BHEL are low leveraged companies with lowest debt to equity ratio with the mean score of 0.35, 0.13 and 0.14 respectively. Also, the standard deviation of GMR Infra (2.58) and Sadbhav Engg (2.45) is high, which indicates that these companies have made number of changes in debt and equity mix over the period of time. On the other hand, other companies with low standard deviation shows that they have made very less changes in their capital structure.

**Table 3:** Return on Capital Employed

This table depicts that Return on Capital Employed ratio is maximum in case of Thermax and BHEL having the mean value of 17.14 and 12.14 percent respectively, which shows that these companies are using their funds effectively.

On the other hand, the companies GMR Infra and Jaiprakash Asso have negative ROCE.

Also, high standard deviation of Thermax, BHEL and Jaiprakash Asso. show inconsistency in their earnings i.e. high fluctuations.

**Table 4:** Return on Equity

This table shows that Return on Equity is highest in case of Adnani Ports and Thermax with the mean score of 19.79 and 19.42 respectively during the study period. This shows that these companies are more profitable as compared to other companies in the study. Hence, these companies will be preferred choice.

On the other hand GMR Infr and Jaiprakash Asso have negative Return on Equity and their higher standard deviation of 22.00 and 74.48 shows very high level of deviation in their return.

**Table 5:** Return on Asset

ROA is efficiency metric. It shows that Thermax and Adnani Ports are using its assets efficiently and effectively generate profits. On the other hand ROA of GMR Infra and Jaiprakash Associates are negative, depicting their inefficient utilisation of their assets to generate profit and an indication that company's performance is deteriorating.

Investors can use ROA figure to analyse which company has efficient utilization and thus make an informed choice before investing in a company. Companies with increasing ROA suggest that profitability of the company is increasing.

**Table 6:** Interest Coverage Ratio

Thermax's and BHEL average interest coverage ratio over the last 10 financial years indicates, that the Company has been generating enough for the shareholders after servicing its debt obligations. Higher interest coverage ratio indicates that the company can easily meet the interest expense pertaining to its debt obligations. Companies with interest coverage ratio of below 1.5 should raise doubts about the company's ability to meet the expenses on its borrowings.

**Table 7:** Descriptive Statistics

Particulars	Range	Minimum	Maximum	Mean
Debt to Equity	10.48	0.01	10.49	2.0740
Return on Capital Employed	63.53	-26.59	36.94	6.0051
Return on Net worth/Equity (%)	266.94	-228.48	38.46	7.3024
Return on Assets (%)	28.34	-14.17	14.17	3.3377
Interest Coverage Ratios (%)	320.98	-51.03	269.95	21.400

The overall descriptive statistics given in table shows that the debt equity ratio of the sample companies is 2.07 and return on asset is 3.34. It means that these companies are not using optimum capital structure. On the other, the minimum and maximum levels of profitability variable i.e. ROE, ROCE and Interest Coverage ratio depicts that he returns of the companies are highly fluctuated.

**Table 8: Correlation Matrix for Capital Structure and Profitability**

Particulars		DE	ROCE	ROE	ROA	ICR
DE	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	90				
ROCE	Pearson Correlation	.334**	1			
	Sig. (2-tailed)	0.001				
	N	90	90			
ROE	Pearson Correlation	.267*	.583**	1		
	Sig. (2-tailed)	0.011	0.000			
	N	90	90	90		
ROA	Pearson Correlation	.428**	.774**	.683**	1	
	Sig. (2-tailed)	0.000	0.000	0.000		
	N	90	90	90	90	
ICR	Pearson Correlation	0.172	.717**	0.157	.442**	1
	Sig. (2-tailed)	0.106	0.000	0.139	0.000	
	N	90	90	90	90	90
**. Correlation is significant at the 0.01 level (2-tailed).						
*. Correlation is significant at the 0.05 level (2-tailed).						
DE = Debt Equity; ROCE = Return on Capital Employed; ROE = Return on Equity; ROA = Return on Assets ; ICR = Interest Coverage Ratio						

Table 7 shows the following results:

P1 :	There exist a relationship between Debt/Equity and Return on Capital Employed.	0.334
P2 :	There exist a relationship between Debt/Equity and Return on Net worth/Equity.	0.267
P3 :	There exist a relationship between Debt/Equity and Return on Assets.	0.428
P4 :	There exist a relationship between Debt/Equity and Return on Interest Coverage Ratio.	0.172

The correlation matrix for all the variables is presented in table 8 in order to examine the correlation that exists among variable.

The result shows that there is a positive correlation between Debt Equity and Return on Capital Employed i.e. 0.334 at 0.01 levels.

There is a positive correlation between:

- Debt Equity and Return on Equity at 0.05 level significantly at 0.267,
- Return on Capital Employed and Return on Equity at 0.01 level significantly at 0.583.

There exists a positive significant correlation for 0.01 levels between:

- Debt Equity and Return on Asset at 0.428,
- Return on Capital Employed and Return on Asset at 0.774 and
- Return on Equity and Return on Asset at 0.683.

There exists a positive correlation between Return on Capital Employed and Interest Coverage Ratio at 0.717 and Return on Asset and Interest Coverage Ratio at 0.442 for 0.01 levels respectively.

## V. Conclusion

One of the most important financing decisions is to choose between the most appropriate level of debt and equity in its capital structure. Hence Capital Structure is the financial foundation for any organisation.

The analysis for relationship between capital structure and profitability for 9 Infrastructural companies for the last 10 years, present study shows that the firms under consideration have moderate debt-equity composition in their capital structure and hence should focus on improving their existing capital structure so that, the companies can enjoy the benefits of leverage.

### Suggested Future Research:

- Examine the influence of capital structure on corporate failure.
- Examine the influence of capital on non-listed firms.
- Regression Analysis and Multiple regression analysis should be performed on the data.
- To clarify the results of study more variables for performance measurement may be useful. Data of long time series could also be used.
- Future research can be processed for comparison between small and large infrastructural firms.

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