INFLUENCE OF CAPITAL GEARING ON FIRM VALUE
EMPIRICAL EVIDENCE FROM INDIAN TRANSPORT &
LOGISTICS SECTOR

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ABSTRACT

The transport and logistics sector is an essential contributor for the development of a country. Since the new economic reforms initiated in 1991, the transportation infrastructure of India has witnessed a paradigm change. The need for transport & logistics services grew at an annual rate of 10%, in the last decade the demand in the transport and logistics sector grew along with the accelerating Indian GDP. This development augmented the demand for capital investment by firms' to enhance the transport & logistics infrastructural facilities to support the growth of manufacturing, trading and service sector of Indian economy. Generally transport & logistics sector firms' are capital intensive and require substantial commitment of capital resources in order to function efficiently. The objective of this research paper is to determine whether in Indian transport & logistics sector, an increase in capital gearing positively or negatively influences the firm value. This research paper has used secondary data sourced from the money control database for the period 2001-2012. The sample firms selected for this research paper were listed on BSE & NSE and firms were stratified into transport & logistics sector. The present study employed correlation and regression tests to prove the postulated hypothesis using SPSS to ascertain the influence of capital gearing on firm value. Finally, the overall findings indicate that there is no significant influence of capital gearing on firm value. The study also concludes that there might be other non- quantitative factors which may lead to nullify the influence of capital gearing on firm value.

Keywords: Transport & Logistics, Capital Gearing, Firm Value, Capital Structure, Regression Analysis, Stakeholders etc.
JEL Classification: G31, G32, G39

Introduction:

Capital Gearing & Firm Value:

Capital gearing reflects the debt amount used in the capital structure of the firm. Capital gearing has an impact on returns of a change in the extent to which the firm's assets are financed with borrowed money. Other things remaining constant, lower the amount borrowed, lower the interest, higher will be the tax burden, lower will be the profit, whereas greater the amount borrowed, higher the interest, lower the tax liabilities, greater will be the profit. Debt carries a fixed service obligation of payments of interest. There is an opportunity to greatly magnify the results at various levels of business operations by using financial leverage. Capital gearing measures firm's exposure to the financial risk. So, degree of Capital gearing indicates the percentage change in EPS resulting from a unit percentage change in EBIT. Capital gearing can accelerate EPS under favorable economic conditions but depresses EPS when the economic goings is not good at macro level and for the firm. The unfavorable effect of Capital gearing on EPS is more severe with more debt in the capital structure when EBIT is negative. Similarly, Capital gearing can increase firm value and as well can increase the firm's risk. The Capital gearing employed by a firm is intended to earn more on the fixed charges funds than their relative costs (Pandey, 2007). Capital gearing is a measure of how much firm uses equity and debt to finance its assets. As debt increases, Capital gearing increases. Management tends to prefer equity financing over debt since it carries less risk. When the surplus increases and deficit decreases, the return on the owners' equity, referred to as a double – edged sword, Capital gearing provides the potentials of increasing the firm value as well as creating the risk of loss to the firm. The Capital gearing is a prerequisite for achieving optimal capital structure. An optimal capital structure can influence the value of firm and wealth of shareholder's

through reduced cost of capital. Hence, determination of optimal debt level and its impact on the firm's over all capital structure is regarded as an integral part of a firm's financial decision (Franklin and Muthusamy, 2011).

Indian Transport & Logistic Sector:

According to KPMG report titled, "Adding Wheels-Investing in the Indian transportation & logistics industry", at 13% of GDP, India's spending on logistics is both significant and inefficient. These inefficiencies are largely a result of India's diverse geographic conditions, poor core infrastructure, complex tax policies and supply side constraints all of which result in high transportation, storage and service costs. However, India's logistics story is indeed an attractive one, based on its rapidly growing economy, the increase in outsourcing of logistics, steady supply side changes, significant government thrust on investment in infrastructure and landmark changes in tax and regulatory policies. It is this attractiveness, along with the potential to tide over inefficiencies that has driven scores of investors and operators to participate in the Indian transportation & logistics sector and, within a short span of time, gain market prominence amongst decades old businesses in a highly fragmented industry. An extremely fragmented structure is only one of the peculiarities and complexities faced by the sector besides fierce price based competition, regulatory intervention, cyclicality and underdeveloped corporate governance standards.

The Indian Transportation & Logistics sector is at an interesting point on its evolution curve. Just in the last decade, the sector has imbibed more sophistication, both on infrastructure and service focus, than it has in previous years. Yet, inefficiencies continue to be the dominant factor in a sector that is both fundamental and critical to the faster growth of the Indian economy. Investors and operators, both foreign and domestic, have placed their money and trust in the Indian infrastructure story, one of the first chapters of which is transportation. The investment in roads, rail, ports and aviation often in the form of public-private partnerships has provided India Inc a firm ground to build on, to trade from, to buy and to sell. Between 2000 and 2010, cargo handling capacity at Indian ports has trebled and the overall length of roads has risen substantially. On the services side, logistics service providers are now able to offer door-to-door, integrated distribution solutions cutting across multiple modes of transportation. However, this multi-modal connectivity will have to achieve greater seamlessness for an optimal operation at an efficient cost. Significant investment in the sector in the hands of strategic operators as well as financial investors is at the heart of this transformation being witnessed in the sector. Investors have stretched their investment theories as well as worked around the governance and control challenges that several segments of this sector pose to allow themselves to invest in the sector. Hence, a deep understanding of the opportunities that stare at the sector and the risks that limit them within the wider regulatory and fiscal framework is desirable for stakeholders, especially investors.

Empirical Literature Review:

Benjamin, (1985), infers that the effectiveness of either bond covenants or implicit capital market monitoring is reduced specially in weak form of market efficiency. Since the market cannot effectively monitor investment decisions, it instead limits the amount of debt. Because high-growth firms cannot be effectively monitored, they will have lower financial leverage.

De Wet (2006) proves that a significant increase in value can be achieved in moving closer to the optimal level of gearing.

Fama and French (2002) conclude that there should be a positive relation between debt ratio and firm profitability.

Firer et al, 2004, and Erhard and Brigham, (2003) says an optimal debt/equity ratio is achieved when the value of a firm is maximized while the cost of capital is minimized.

Hyde (2007) states that changes in interest rates will alter a firm's financing costs, affecting the amount of loan interest and principle payments and ultimately impact a firm's cash flows.

Lasher (2003) asserts that increased levels of debt finance can result in increased Earning Per Share and Return On Equity.

Mandelkar, et al, (1984) states when a firm employs a high level of operating and financial leverage, even a small change in the level of sales, will have dramatic effect on EPS.

Modigliani and Miller (1958), who derived the leverage irrelevance theorem, concluding that capital structure does not impact firm value in an ideal environment.

Modigliani and Miller (1963) issued a correction in their earlier theory and still argue that a change in the debt/equity ratio does not impact on firm value; however when taxes and other transaction costs are considered it results into lowering a firm's WACC as debt increases.

Myers, (1977) recognized that the underinvestment problem by noting that shareholders of firms with risky debt will invest only when or up to the point at which, the expected return on investment is at least as great as the promised payment to bondholders. When the expected return is less than the promised payment, shareholders fail to exercise the investment option or invest less than the optimal amount, which reduces firm value. It is this decline in firm value which limits the amount of debt a given firm can issue.

Myers (1984) holds that the various capital structure theories do not explain actual financing behavior and it is therefore presumptuous to advise firms on optimal capital structure.

Myers (2001) postulates that debt offers firm a tax shield and firms therefore pursue higher levels of debts in order to gain the maximum tax benefit and ultimately enhance profitability. However, high levels of debt increases the possibility of bankruptcy.

Sharma (2006) concludes that there is a direct correlation between leverage and firm value.

Rajan and Zingales (1995) find a negative relationship between debt and profitability.

Ross (1977) posits that firm managers possess more information about the future prospects of the firm than the market. Increasing leverage would signal to the market that a firm's managers are confident about servicing the interest charges. Therefore an increase in leverage would increase the value of the firm since investors would deem this to be a positive signal of the size and stability of future cash flows.

Schwartz and Aronson's (1967) research concludes that the capital structures of firms in different industries are different

from each other. They indicate that the capital structure in specific industry sectors over time is dynamic, given firm's pursuit to maximize value.

Ward and Price (2006) indicate that an increased debt/equity ratio in a profitable business increases shareholder returns, but also increases risk.

Objectives:

1. To verify whether firm's capital structure correlate to firm value with respect to Indian transport & logistics sector
2. To investigate whether capital gearing influences firm value with respect to Indian transport & logistics sector

Hypotheses:

1 H_0: Firm's capital structure and value of firm indicate an inverse relationship with respect to Indian transport & logistics sector
   H_1: Firm's capital structure and value of firm indicate a positive relationship with respect to Indian transport & logistics sector
2 H_0: Increase in capital gearing ratio result in negative value for the firm with respect to Indian transport & logistics sector
   H_1: Increase in capital gearing ratio result in positive value for the firm with respect to Indian transport & logistics sector

Scope of the Study:

The study has concentrated on the composition of capital structure & capital gearing and its influence on the value of a firm with special reference to Indian transport & logistics sector firms that were listed on the Indian national stock exchanges viz, BSE & NSE.

Research Methodology:

This research paper tested influence of capital structure composition & capital gearing on the value of a firm by considering financial ratios for the select sample firms. The proxy for firm value is EPS, ROCE, ROA, RONW, OPM, & NPM. The researchers have employed causal research design. Researchers have tried to discover cause-effect relationships between capital gearing & firm value.

Sample Size & Selection:

From the total population the sample selected was stratified by industry sector in order to better understand the characteristics of the homogeneous subsets (Albright, 2006). The next part of the selection required that all companies in the sample were listed on the national exchanges for the period April 2001 to March 2012. Researches have tried to conduct longitudinal analysis in order to identify relationship between changes in capital structure, capital gearing and firm value for Indian transport & logistics sector firms. The sample size was restricted to 5 firms. The final selection of firms is listed in the table 1.

Table 1: Sample Firm Information

Sl. No.	Company Name
1	Allcargo Logistics Ltd.
2	Transport Corporation of India Ltd.
3	Aegis Logistics Ltd.
4	Arshiya International Ltd.
5	Patel Integrated Logistics Ltd.

Data Collection:

For the present study the researches have used secondary data which was obtained from money control database. Money control database is the reliable and valid source for financial data relating to publicly listed Indian firms, fundamental research data, etc. All standardization is carried out by the agency's financial analysts. Therefore the information provided is both comprehensive & accurate.

Data Analysis:

The present study has considered use of statistical tools as they are effective in data interpretation & facilitate drawing inferences based on statistical analysis. Capital gearing [debt-equity ratio] was the independent variable and all the profitability & growth ratios, as well as the earnings per share were dependent variables.

The financial performance analysis of the sample firms have been carried out using ratio analysis technique. Conducting comparisons using financial ratios avoids the problem of comparing companies of different sizes (Firer et all, 2004).

Statistical Tool & Techniques:

The statistical tools utilized in this study were regression & correlation analysis. Regression analysis was used to determine the relationship between the variation in firm value & capital structure. The debt to equity ratio was used as a proxy for capital gearing and the select ratios such as ROCE, RONW, ROA, EPS, OPM, & NPM were used for firm value. The various tests were conducted with 95% confidence interval. The confidence interval is the set of acceptable hypothesis or the level of probability associated with an interval estimate (Zikmund, 2003). The data has been analyzed with the help of SPSS and MS-Excel.

Limitations of the Study:

1. The study has focused only on Indian transport & logistics sector and do not consider other industries or companies operating in Indian market due to the inadequacy of data, time and resources
2. The study has ignored the impact of possible differences in the accounting methods adopted by different sample companies.
3. The study has also not used any control groups for comparison
4. The small sample size of the study, which might bring in the question of statistical validity of the results.
5. It was restricted to the financial data of firms listed on the BSE & NSE for the last ten years (2001-2010). It therefore does not represent time periods beyond this.

Hypotheses Testing & Presentation of the Results:

The testing of hypothesis is performed using statistical tools and the results are presented in the form of tables as follows. Researchers have made an attempt to draw inferences from the results obtained with respect to the postulated hypothesis.

Hypothesis 1:

To test the significant relationship between the firm's capital structure and firm's value, the following null and alternative hypotheses are proposed:

H_0: Firm's capital structure and value of firm indicate an inverse relationship with respect to Indian transport & logistics sector

H_1: Firm's capital structure and value of firm indicate a positive relationship with respect to Indian transport & logistics sector

The hypothesis is evaluated by applying Karl Pearson Correlation Matrix Analysis at 0.01 (99%) significance level and the results are shown in the following table.

Table 2 Correlation Model Summary

Capital Structure Proxy Variable	Firm Value Proxy Variable	Pearson Correlation Value "R"	Significance Value "p"
DEBT/EQUITY (D/E)	ROA	-0.195	0.136
	ROCE	-0.012	0.930
	RONW	0.119	0.364
	OPM	0.059	0.657
	NPM	-0.419	0.001**
	EPS	0.142	0.279
** Correlation is significant at the 0.01 level (2-tailed)			

- **D/E and ROA:** At $\alpha = 0.01$ significance level, there is an inverse correlation between the select variables as indicated by R = -0.195. Further the relationship is statistically not significant as revealed by probability value, p = 0.136 for 2-tailed test.
- **D/E and ROCE:** At $\alpha = 0.01$ significance level, there is an inverse correlation between the select variables as indicated by R = -0.012. Further the relationship is statistically not significant as revealed by probability value, p = 0.930 for 2-tailed test.
- **D/E and RONW:** At $\alpha = 0.01$ significance level, there is no inverse correlation between the select variables as indicated by R = 0.119. Further the relationship is statistically not significant as revealed by probability value, p = 0.364 for 2-tailed test.
- **D/E and OPM:** At $\alpha = 0.01$ significance level, there is no inverse correlation between the select variables as indicated by R = 0.059. Further the relationship is statistically not significant as revealed by probability value, p = 0.657 for 2-tailed test.
- **D/E and NPM:** At $\alpha = 0.01$ significance level, there is an inverse correlation between the select variables as indicated by R = -0.419. Further the relationship is statistically significant as revealed by probability value, p = 0.001 which is attributed to chances.
- **D/E and EPS:** At $\alpha = 0.01$ significance level, there is no inverse correlation between the select variables as indicated by R = 0.142. Further the relationship is statistically not significant as revealed by probability value, p = 0.279 for 2-tailed test.

Table 2 reveals that there is a negative and weak correlation between capital structure of firm and firm value as Correlation Value "r" is less than 0.8 in all the cases and the Significance Value "p" is more than the assumed significance level of **0.01** except for NPM, which indicates that capital structure hold an inverse relationship with proxy firm value variables.

Thus the null hypothesis, **'Firm's capital structure and value of firm indicate an inverse relationship with respect to Indian transport & logistics sector'** is accepted and the alternative hypothesis, **'Firm's capital structure and value of firm indicate a positive relationship with respect to Indian transport & logistics sector'** is rejected.

Hypothesis 2:

To test the influence of capital gearing on firm value, the following null and alternative hypotheses are postulated:

H_0: Increase in capital gearing ratio result in negative value for the firm with respect to Indian transport & logistics sector

H_1: Increase in capital gearing ratio result in positive value for the firm with respect to Indian transport & logistics sector

The independent variable, capital gearing, represented by the debt-equity ratio was found to be correlated with the dependent variable, represented by the select ratios like: ROA, ROCE, RONW, OPM, NPM & EPS. The dependent and independent variables shows an inconclusive correlation. Regression analysis was conducted on data over ten year period to determine a cause-effect analysis between independent and dependent variables if any. The regression model summary parameters were used in order to determine the influence of capital gearing on firm value. R explains the degree of relationship with respect to two variables. R^2 shows the extent or percentage value of the output variable's variance as explained by the input variables i.e. dependent variable value explained by independent variables. In other words, R^2 explains the influence of select independent variable on dependent variable in terms of percentage value. Whereas adjusted R^2 shows that with putting the new independent variable in the regression equation, chances of improvement in the R^2 parameter.

Table 3 Regression Model Summary

Independent Variable	Dependent Variable	R	R^2	Adj. R^2	Std Error	df 1	df 2	F	Sig.
DEBT/EQUITY (D/E)	ROA	-0.19	0.038	0.021	44.42	1	58	2.285	0.136
	ROCE	-0.01	0.001	-0.017	34.05			0.008	0.930
	RONW	0.12	0.014	-0.003	13.05			0.836	0.364
	OPM	0.06	0.003	-0.014	15.71			0.199	0.657
	NPM	-0.42	0.175	0.161	5.71			12.34	0.001
	EPS	0.14	0.020	0.003	40.01			1.95	0.279

- **D/E and ROA:** There exits a weak negative relationship between the select variables. An increase in capital gearing ratio influences gradual decrease in return on assets ratio. 3.8% of the value of return on assets can be explained by the debt-equity ratio and the remaining 96.2% of value is credited to other variables which influences return on assets in the Indian transport and logistics sector. Whereas adjusted R^2 stands at 0.021, which shows that with putting the new variable in the regression equation, chances of improvement in the R^2 is very less. Calculated F value 2.285 is less than critical f table value of 4.01 & calculated significant value 0.136 is more than assumed significance level value of 0.005

- **D/E and ROCE:** There is a very weak negative relationship between the select variables. An increase in capital gearing ratio influences gradual decrease in return on capital employed ratio. 0.1% of the value of return on capital employed can be explained by the debt-equity ratio and the remaining 99.9% of value is attributed by other variables which influences return on capital employed ratio in the Indian transport and logistics sector. Whereas adjusted R^2 stands at -0.017, which shows that with putting the new variable in the regression equation, chances of improvement in the R^2 is meager. Calculated F value 0.008 is less than critical f table value of 4.01 & calculated significant value 0.930 is more than assumed significance level value of 0.005

- **D/E and RONW:** An increase in capital gearing ratio influences slow increase in return on net worth ratio. 1.4% of the value of return on net worth can be explained by the debt-equity ratio and the remaining 98.6% of value is contributed by other variables which influences return on net worth ratio in the Indian transport and logistics sector. Whereas adjusted R^2 stands at -0.003, which illustrates that with putting the new variable in the regression equation, chances of improvement in the R^2 is not possible.

- **D/E and OPM:** There exits a weak positive relationship between the select variables. An increase in capital gearing ratio influences steady increase in operating profit margin ratio. 0.3% of the value of operating profit margin can be explained by the debt-equity ratio and the remaining 99.7% of value is credited to other variables which influences operating profit margin in the Indian transport and logistics sector. Whereas adjusted R^2 stands at -0.014, which shows that with putting the new variable in the regression equation, chances of improvement in the R^2 is very less.

- **D/E and NPM:** There exits a weak negative relationship between the select variables. An increase in capital gearing ratio influences gradual decrease in return on assets ratio. 17.5% of the value of net profit margin can be explained by the debt-equity ratio and the remaining 82.5% of value is credited to other variables which influences net profit margin in the Indian transport and logistics sector. Whereas adjusted R^2 stands at 0.161, which shows that with putting the new variable in the regression equation, chances of improvement in the R^2 is less. Calculated F value 12.34 is more than critical f table value of 4.01 & calculated significant value 0.001 is less than assumed significance level value of 0.005. Only this pair of variables has show statistical significance in regression analysis which is by chance.

- **D/E and EPS:** There is a weak positive relationship between the select variables. An increase in capital gearing ratio influences slow increase in earning per share ratio. 2% of the value of earning per share can be explained by the debt-equity ratio and the remaining 98% of value is contributed by other variables which influences earning per share in the Indian transport and logistics sector. Whereas adjusted R^2 stands at 0.003, which shows that with putting the new variable in the regression equation, chances of improvement in the R^2 is very less. Calculated F value 1.95 is less than critical f table value of 4.01 & calculated significant value 0.279 is more than assumed significance level value of 0.005

The information in table 3 shows that three out of six variables that were proxy for the firm value were negatively correlated with capital gearing ratio. Remaining three variables that show positive correlation but they are all statistically not significant as indicated by significant probability value. The calculated F value is less than the critical table value at respective df1, df2 & α value except for NPM variable. Also the significant probability value is more than the assumed significance level with a special case of NPM wherein calculated value is less than significance value. Therefore it is evidenced that there is no substantial value creation for the firm with an increasing level of capital gearing with respect to Indian transport & logistics sector.

Thus the null hypothesis, 'Increase in capital gearing ratio create negative value for the firm with respect to Indian transport & logistics sector' is accepted and the alternative hypothesis, 'Increase in capital gearing ratio create positive value for the firm with respect to Indian transport & logistics sector' is rejected.

Findings:

- The results of this research paper shows that capital structure inversely influences firm value and are in line with the findings of Rajan and Zingales (1995) and Myers (1984).
- However, past research on capital structure has found that an increase in capital gearing positively impacts on firm value (Ward and Price, 2006; Sharma, 2006; Firer et all, 2004).
- The underlying assumption for optimal capital structure is that firms under investigation operate in an efficient market environment. In the context of the Indian transport & logistics sector the assumption of efficient market might not be applicable to the full extent and this could therefore explain the negative influence on firm value.
- An additional explanation for the negative influence of capital gearing on firm value can be attributed to the to the firms in sample pursuing debt to reduce their tax burden, in line with trade off theory where Myers (2001) postulates that debt offers a firm tax shield.
- An exact optimal capital structure is difficult to establish. A range exists wherein capital structure could maximize firm value (De Wet, 2006). Therefore, managers should acknowledge this range as well as the fact that it is different for each industry or sector.
- The small sample size may have contributed to the results' failure to show a positive correlation & influence.

Suggestions:

- Finance manager should consider changes in monetary policy; interest rate etc and appropriately vary debt & equity composition in order to make capital structure optimal.
- Financial institutions and bankers should facilitate debt at a lower interest rate based on firm's riskiness & quality of future earnings prospect
- Firms could form respective industry associations in order to get bargaining power for procurement of loan from banks or government institution at a lower interest rate
- Adequate equity capital could be employed so as to augment borrowing capacity of the firm to get significant influence of capital gearing
- Firm should strive to maintain lower weighted cost of capital by way of borrowing funds from domestic and/or foreign fund providers or sources

Conclusion:

The study has tried to verify whether or not a relationship exists between capital gearing and firm value. The findings show a correlation for select firms; however an inverse relationship exits between capital gearing and firm value. The overall findings indicate that there is no significant influence of capital gearing on firm value. The study also concludes that there might be other non quantitative factors which may lead to nullify the influence of capital gearing on firm value, macro-economic factors like recession, saturation of industry, competition and government policy. What is evident form this study is the complex nature of capital structure and its influence on firm value. The number of ratios as proxies for firm value added to the complexity of this study. Some of the ratios contained common elements which could cause the results to be inconclusive.

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