Impact of Financial Performance on Capital Structure: Investigation of Indian Automobile Sector

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ABSTRACT

Our study aims to analyse the impact by profitability, asset size, growth, leverage and liquidity on the capital structure of a firm. To empirically examine the impact, top 5 leading automobile companies listed on NSE/BSE. To analyse the impact, study has applied ordinary least square (OLS) regression to evaluate the impact of identified variables on capital structure of selected financial variables. The models are diagnosed for autocorrelation, multicollinearity, homogeneity and normality of standard residuals. The selected companies showed that their explanatory variables are explaining the variances of dependent variables above 80 percent and the model were significant at 5 percent level of significance using F test. For M&M, the variables NP/TA, Gro and LIQ have positive relation whereas LN-TA has negative relation dependent variables. All variable, except Gro have significant relation with capital structure. For Force Mo, the variables NP/TA, Gro, NDTS have positive relation whereas LN-TA and LIQ have negative relation dependent variables. All variables had insignificant relation with capital structure.

Keywords: Capital Structure, Liquidity, Asset Size, Leverage, Profit

1. Introduction

A firm can achieve its objective of shareholders' wealth maximization by applying right financial management strategies. The three main function of financial management of a firm are investing, financing and short-term asset management. Financing functions are related to decisions on selecting right capital instrument and proportion of the same, McInnes, J. M., & Carleton, W. J. (1982); Anand, M. (2002).The portfolio of long-term financing alternatives is popularly known as capital structure. There are various capital structure theories proposed which have tried to describe how a firm can select optimal capital structure along with determination of cost and benefit of using leverage for investor and financers.Net income approach (Durand, 1952) explained that the value of firm is affected inversely by cost of capital with an assumption of cost of debt constant and cheaper that cost of equity. The value of firm will increase as more debt is used ignoring that increased financial risk due to increase in amount of debt. If the financial risk is increased using more amount of debt or leverage, the expected return of equity holders will increase and thus total cost of capital would remain constant and hence the value of firm will not be affected by cost of capital and will only depend on the financial performance (Durand, 1957). Traditional approach (Solomon, 1963) suggested that the value of firm will increase as it will use as debt is increased up to certain amount. But eventually the increase of debt would increase cost of debt along with cost of equity and hence the cost of capital will increase.

Modigliani and Miller (1958) hypothesis proposed that the value of the firm will not be dependent on the proportion of debt and equity as firm capital. Modigliani and Miller (1963) But, if tax is considered, that use of more proportion of debt will help to gain benefit in short run. Pecking order theory (Myers' 2001) stated that managers use the logic of asymmetric information, available to different investors, in using financing alternatives preferring internal fund or retained earnings, followed by debt fund and issuance of equity as last resort. The asymmetric information makes investors expect higher return for investment opportunities with less information.

Optimal timing theory (Baker and Wulger, 2002) suggested that historical market values and market timings affects that the firms' capital structure decisions. The firms which had high market valuations preferred lower debt and higher equity and firms which had low market valuations preferred higher debt and lower equity. Thus, leverage was found to be strongly negatively related to historical market valuations.

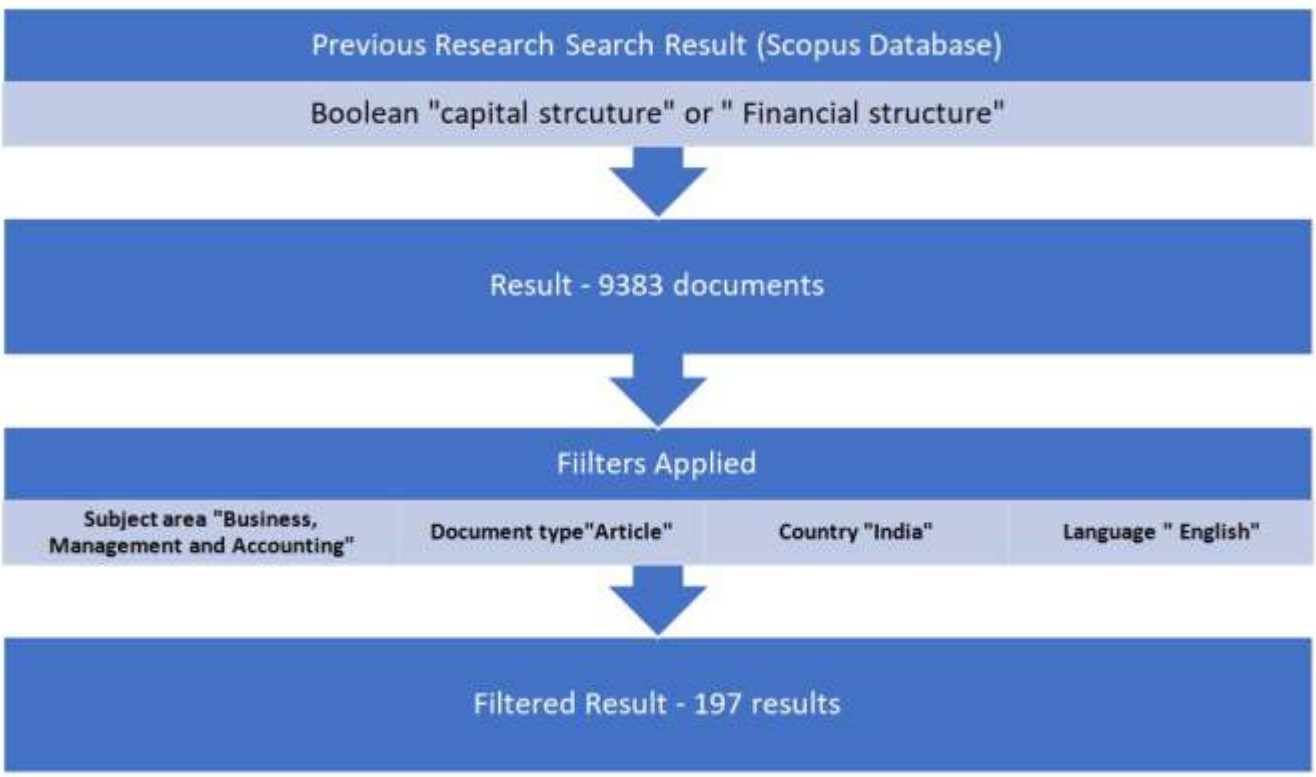
The capital structure decision affect various key performance indicators viz., Net income, required rate of return of equity shareholders, leverage, cost of debt and cost of capital. So before examining the descriptive characteristics and relationships impacts among study variables, we have tried to explore and estimate important performance indicators related to capital structure.

In the study carried on Indian cement industry to identify the relationship between the capital structure, total cost of capital and firms market capitalization or value in market evidenced that there was no association and impact of capital structure on total cost of capital as well as on total market capitalization i.e. market value of the firms in Indian cement industry(Bhayani, 2009).

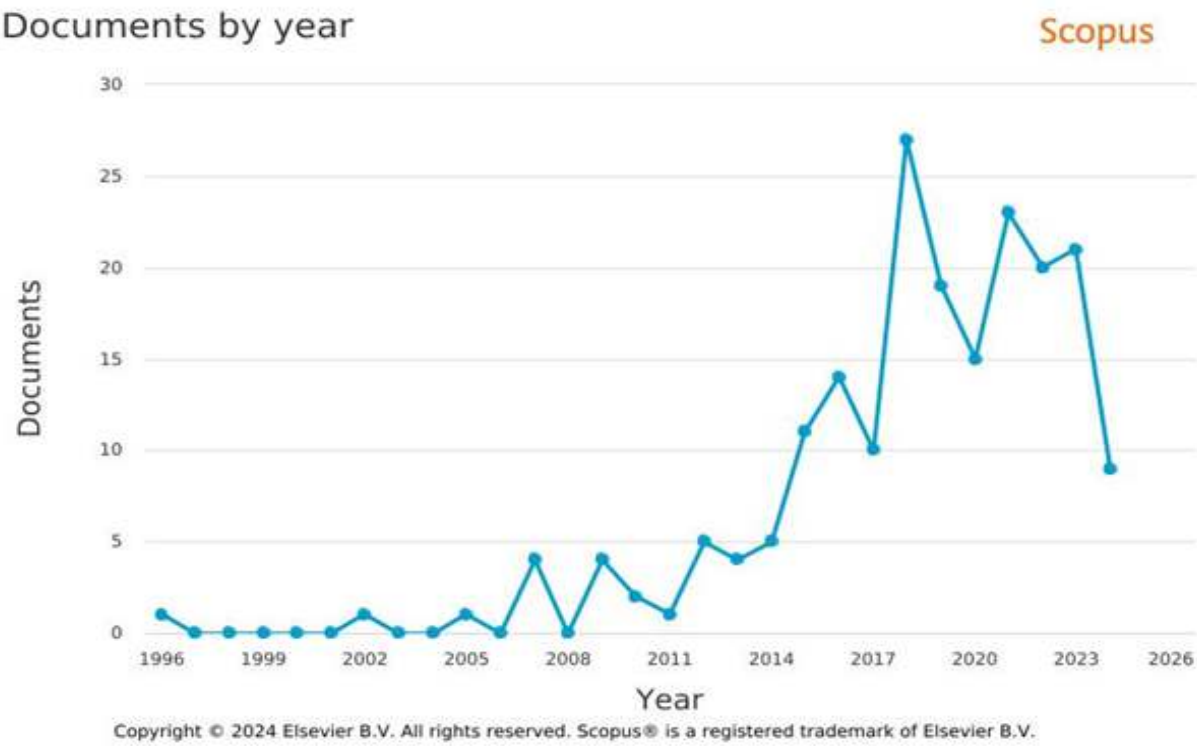
The study on the factors affecting the capital structure decision of SMEs in India using generalised method of moments confirmed the applicability of the pecking order theory for SMEs in India.(Rao et al., 2020). The study on the growth of start-ups aimed to examine whether in Croatia firms shifted from traditional to the newer methods of financing (Čalopa et al., 2014).The cost of equity is also affected by the corporate social responsibility (CSR). The effect of corporate social responsibility on cost of equity has varying results due to the firms' ownership structure and economic conditions. The government firms' showed better CSR and lower cost of equity than non-government firms' in spite of the higher impact of CSR on reducing cost of equity for non-government firms'(Xu et al., 2015).The relationship between financial leverage and determinants of capital structure of four top companies of Indian automobile industry resulted that the liquidity, size, profitability, growth rate, and tangibility were significant for financing decisions(Mittal & Kumari, 2016).The factors affecting the capital structure decisions of small and medium enterprises (SMEs) in India was observed using the sample consisting of 174 non-financial firms and generalised method of moments (GMM) was used and found that the effect of firm's profitability, tangibility, size, age, growth, liquidity, non-debt tax shield, cash flow ratio, and return on equity on the leverage of the firm confirmed the applicability of the pecking order theory for SMEs in India.(Rao et al., 2020).

2. Review of Literature and Hypothesis Development

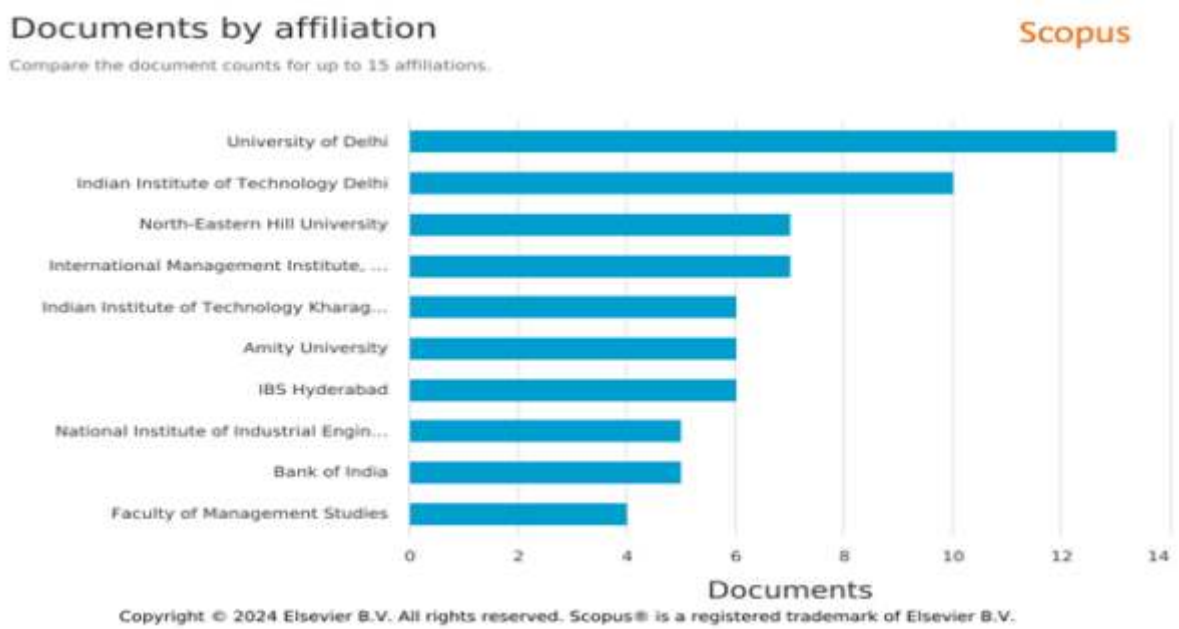
The study is built on specific literature on capital structure or financial structure study conducted on automobile sector. The search flowchart are below:



The authors have analyse the filtered result and tried to understand the relevant research studies conducted on capital structure in automobile in India.



The y-o-y publication is not very high , maximum article published is 27 in year 2018. If we see in last 10 year period, from 2014 to 2023, the Average Annual Growth in publication of related studies in scopus indexed journal is 18.04%, with just 04 documents in 2014 to 21 documents in 2023.



From the above figure, we can the top institutions or organisations contribution in related studies. University of Delhi is at top with 13 documents, followed by Indian Institute of Technology Delhi with 10 documents. We have Bank of India as only one non educational organisation in the top 10 list.

From the figure above, we can see the topic 10 authors contributing to the literature of capital structure studies in India. We also noticed out top 10 authors, 4 authors are from Non-top 10 publishing institution/ organisations, e.g., Panda, A.K (NITIE Mumbai, Kumar S (IIM Nagpur), Mundi, H.S, (IMT Ghaziabad) and Agarwal, Y (Bharati Vidyapeeth (Deemed to be University), Pune.We have also tried to see the top source publishing the related articles. The y-o-y trends are depicted below.

In total, the top 5 journals and their total related articles are

Journal	Publisher	No. of Articles
Global Business Review	SAGE	15
Managerial Finance	Emerald Publishing	11
Vision	SAGE	10
Finance India	Indian Institute of Finance	8
Journal of Advances in Management Research	Emerald Publishing	7

Source: Tabulated by Authors.

The firms' management prefers borrowing loan than any other means of financing and capital components, but beyond certain level of borrowing loan, the financial risk increases and lead to increase in cost of capital.

2.1. Capital structure on Profitability

The interrelationship among the capital structure and profitability is paradoxical and result varies between the sectors as well within a particular sector. A study conducted on construction sector indicated that the capital gearing ratio having negative relationship with profitability. The gearing ratio was higher among the contractors and developers, whereas the borrowings were much higher among developers, Yat Hung, C., Ping Chuen Albert, C., & Chi Man Eddie, H. (2002). The capital structure studies in real estate companies in UK contradicted the literature and resulted that borrowings has constructive effect on profitability firms size adversely effected on fluctuation on income and return on assets (Westgaard et al., 2008). The firms' size effect on profitability was not discovered in Australian firms. The well-established puzzle that leverage is adversely associated with profitability steps was revisited. Cross-sectional association between profitability and leverage is positive at times when companies are at or near to their optimum level of leverage. It is always pessimistic. In the quarters prior to rebalancing events, the time series of market leverage and profitability corresponded to the trends that models forecast(Danis et al., 2014).

H1: There is no significant relationship between capital structure on profitability

2.2. Capital structure on asset size

The profitability of the firm can be measured by return on equity (ROE) or return on investment (ROI) or return on asset (ROA). The analysis of firms' level factors viz., asset size, firm age, debt amount and ownership, on capital structure revealed that the capital structure emerged a significant factor affecting profitability ratios, ROE and ROI, Mahmoud Abu Tapanjeh, A. (2006). The assets tangibility and ratio of debt to asset were positively related to each other whereas business risks measured by unlevered beta of equity were inversely related to ratio of debt to asset. The profitability of leveraged firms are more than unlevered firm but the latter has lower debt ratio(Qiu & La, 2010).

Similarly, the effect of firms' size on profitability of manufacturing firms in Sri-Lanka resulted that there was no relationship between assets size and sales amount on net profitability and return on assets(Niresh & Velnampy, 2014).

The profitability of health care organizationsis affected byfirm level factors viz., ownership, firms' size, geographical area and associations. The firms' profitability can be increased by improving margins, operational efficiency and

capital components proportions, although these variables were non-significant. The health care organisation type has small effects by its associations, geographical locations and teaching facilitation (Turner et al., 2015).A firm value is highly affectedby size of assets. The role of capital structure of firm as intervening variable has no impact on relationship of firm value and asset size, Setiadharma, S., &Machali, M. (2017).

H2: There is no significant relationship between capital structure on asset size

2.3. Capital structure on business growth

In the study of assessing capital structure of a subsidiary companies that is disbursed through a spin-off explored that companies financial structure analyses includes the debt level of the subsidiary with respect to the original capital structure. Mostlyin companies, the debt of the subsidiary was negatively related to growth and positively related to its collateral value. However, unlike most companies, debt was not inversely correlated to profitability and the disparity between the debt levels of the subsidiaries and similar businesses was positively related to the earnings (Dittmar, 2006.).The study on financial variables to analyse the financial position of Maruti Suzuki identified the strength and weakness areas of the company to suggest the appropriate variables to focus to maximize the intrinsic value of the company(Ramya & Kavitha, 2017).

H3: There is no significant relationship between capital structure on business growth

2.4. Capital structure on liquidity

The optimal capital structure helps firms' to better manage risk and its performance thereof. The ability of managing risk in banks is crucial and is evidenced by efficient banks increase cash holdings and reduces risk weighted assets. Also, the increase of capital buffer helps bank to increase their ability in taking higher credit risks. But in banks, there is a problem of non-uniformity of measurement of the capital buffers and risk measures(Ding & Sickles, 2018).

H4: There is no significant relationship between capital structure on liquidity

2.5. Capital structure on leverage

The effect of debt and equity on performance of the company analysed using EBIT –EPS analysis evidenced that increase in level of borrowings and net worth increases the debt equity ratio. Capital structure decision is important for any organisation and it plays an important role for future of any business(Niresh & Velnampy, 2014).

H5: There is no significant relationship between capital structure on leverage

Our study aims to compare the leading Indian automobile companies' capital structure determinants, their characteristics and their impact. The study applies multiple regression analysis along with important diagnostic analysis viz., autocorrelation, multicollinearity, heteroscedasticity and normality.

1. Objectives and Research Methodology

3.1. Objective

To identify the relationship of capital structures with firms' profitability, asset size, leverage, business growth and liquidity.

3.3. Sample and period of study

A comparative study of capital structure and its determinants is carried on major Indian automobile companies i.e., Maruti Suzuki Ltd, Tata Motors, Ashok Leyland, Mahindra & Mahindra and Force Motors. The study is carried on data or 10 years from the period of 2010-11 to 2019-20 and the data is collected from annual reports and Bombay Stock Exchange, India.

Based on e-contents available on research libraries and databases like EBSCO, SSRN, Sage publications, Research gate, etc. the study which focused on capital structure of Indian automobiles companies are not carried extensively in recent year (after 2010).

3.4. Variables of study

- DER: Debt equity ratio (Durand 1952, 57), (Modigliani and Miller, 1963), (Myers' 2001), (Danis et al., 2014), (Čalopa et al., 2014), (Rao et al., 2020)
- NP/TA: Return on Asset (ROA) Profitability ratio measured by Net profit to Total assets (Mittal & Kumari, 2016), (Mittal & Kumari, 2016), (Rao et al., 2020)
- LN-TA: Size of firm measured by Log of Total assets (Mittal & Kumari, 2016), (Mittal & Kumari, 2016), (Rao et al., 2020)
- Gro: Growth rate of sales (Mittal & Kumari, 2016), (Mittal & Kumari, 2016), (Rao et al., 2020)
- NDTS: NonDebt tax shield measured by Depreciation to Total Assets (Mittal & Kumari, 2016), (Mittal & Kumari, 2016), (Rao et al., 2020)
- Liq: Liquidity measured by current asset to current liability (Mittal & Kumari, 2016), (Mittal & Kumari, 2016), (Rao et al., 2020)

3.5. Statistical Techniques

The multivariate regression analysis is extended form to simple linear or bivariate regression with more than one explanatory variables. The general multivariate regression model can be represented as below;

$$Yi = \beta_0 + \beta_1 X_1, i + \beta_k X_k, \underline{i} + \varepsilon_i$$

Where, Y_i, X_{1i},…X_{ki} represent the ith observations of each variables Y, X_1….X_k respectively, are fixed parameters and b_0 b_1..... b_k are fixed parameters and e_i is a random variable that is normally distributed with mean equal to zero and have a constant variance s^2_e

Along with assumptions of bi-variate regression, multivariate regression has other assumptions for robust modelling (Judge et al., 1988).

a) The explanatory variables X_1….$X_k$are not correlatedwith each other i.e. multicollinearity should not exists. Correlation matrix is used to test the same.

b) The explanatory variable X_1….$X_k$should not beautocorrelated with its own lag values. Auto Correlation Factor (ACF) is estimated to test the same

c) The explanatory variables X_1….X_k take the random numbers and the error terms of variables are uncorrelated with each other. Residual plots are used to identify the same.

d) The residual terms should have same variance i.e., heteroscedasticity should not exist. Q-Q plot is used to check the normality.

Although the above assumptions violation does not affect much on coefficients and the impact result of explanatory variables on dependent variable, the coefficients of determination and model usage for prediction can result insignificant result.

The descriptive analysis using Mean, Std Deviation, Skewness and Kurtosis is performed followed by estimation of impact of relationship between dependent variable, ordinary least square (OLS) regression analysis was conducted using below equation;

$$\mathbf{DER_{it}} = b_0 + b_1 \mathbf{NP/TA_{it}} + b_2 \mathbf{LN\text{-}TA_{it}} + b_3 \mathbf{Gro_{it}} + b_4 \mathbf{NDTS_{it}} + b_5 \mathbf{LIQ_{it}} + e_{it}$$

Where,

DER is Debt equity ratio

NP/TA is Profitability ratio measured by Net profit to Total assets

LN-TA is Size of firm measured by Log of Total assets

Gro is Growth rate measured sales growth

NDTS is NonDebt tax shield measured by Depreciation to Total Assets

LIQ is Liquidity measured by current asset to current liability

e_i is the error term of variables

1. Data Analysis

1.1. Descriptive statistics

Table 1 depicts the outcome of descriptive statistics of all the variables company wise for the study period. The DER mean highest value is of Tata motors at 0.732 and lowest value is of Maruti Suzuki at 0.051 among all the selected companies. The NP/TA mean highest value is of Maruti Suzuki at 0.116 and lowest value is of Tata Motors at -0.001. The LN-TA mean highest value is of Tata Motors at 10.89 and lowest value is of Force Motors at 7.5. The Growth mean highest value at 0.156 which is equal among Force motors, Ashok Leyland and Tata Motors whereas M&M has lowest value of 0.119. The NDTS mean highest value is of Maruti Suzuki at 0.058 and lowest value is of M&M at 0.029. The Liquidity mean highest value is of Force Motors and Tata Motors at 1.622 whereas lowest value is of Force Motors at 0.975.

Table 1: Descriptive Statistics

		DER	NP/TA	LN-TA	Gro	NDTS	LIQ
M&M	Mean	0.199	0.109	10.335	0.119	0.029	1.166
	Std Dev	0.093	0.018	0.373	0.126	0.005	0.118
	Kurt	-0.852	-1.876	-0.610	-0.438	-0.505	1.071
	Skew	0.425	0.165	-0.294	0.668	0.427	-0.928
Force Mo	Mean	0.138	0.098	7.500	**0.156**	0.045	**1.622**
	Std Dev	0.164	0.141	0.394	0.189	0.006	0.457
	Kurt	2.304	9.499	0.190	0.464	-1.123	2.100
	Skew	1.787	3.048	-0.947	1.110	0.217	0.503
Ashok Ley	Mean	0.535	0.054	9.480	**0.156**	0.031	0.975
	Std Dev	0.263	0.035	0.201	0.214	0.005	0.163
	Kurt	-1.392	-0.872	0.160	-0.613	-0.377	4.283
	Skew	-0.602	0.375	0.138	0.041	-0.339	1.903
Tata Mo	Mean	**0.732**	-0.001	**10.899**	**0.156**	0.040	**1.622**
	Std Dev	0.145	0.042	0.073	0.189	0.012	0.457
	Kurt	-0.047	1.910	-1.189	0.464	-1.330	2.100
	Skew	0.711	-1.358	0.508	1.110	-0.523	0.503
MrSki	Mean	0.051	**0.116**	10.401	0.133	**0.058**	1.211
	Std Dev	0.014	0.025	0.476	0.116	0.010	0.614
	Kurt	-0.391	-0.710	-1.331	-1.570	-1.868	-0.446
	Skew	0.769	-0.374	-0.022	-0.186	0.424	0.774

M&M

From the table of descriptive statistic of M&M, average value of NP/TA is highest and NDTS is lowest of all the study variables. The std deviation value of LN-TA is highest and NDTS is lowest. All variables, except LIQ has negative kurtosis value. All variable except LN-TA, have positive skewness value. The NP/TA with 0.16 skewness is least skewed. Based on results, it is very to conclude distribution of any variables to be close to normal.

Force Motors

From the table of descriptive statistic of force motors, average value of NP/TA is highest and NDTS is lowest of all the study variables. The std deviation value of LIQ is highest and NDTS is lowest. NP/TA has highest kurtosis value whereas NDTS has lowest value, but the variable which has kurtosis value close to 3 is DER followed by LIQ. All variable except LN-TA, have positive skewness value. The NDTS with 0.21 skewness is least skewed. So, out of all the variables, NDTS is most close to represent a normal distribution.

Ashok leyand

From the table of descriptive statistic of Ashok leyland Ltd., average value of LN-TA is highest and NDTS is lowest of all the study variables. The std deviation value of DER is highest and NDTS is lowest. All variables, except LN-TA and LIQ has positive kurtosis value. All variable except DER and NDTS, have negative skewness value. The Gro with 0.0408 skewness is least skewed. Based on results, it cannot be concluded that distribution of any variables not normal.

Tata Motors

From the table of descriptive statistic of Tata Mo, average value of LN-TA is highest and NP/TA is lowest of all the study variables. The std deviation value of LIQ is highest and NDTS is lowest. DER, LN-TA and NDTS have negative kurtosis value whereas NP/TA, GRO and LIQ have positive kurtosis values. All variable except NP/TA and NDTS, have positive skewness value.

Maruti Suzuki

From the table of descriptive statistic of Maruti Suzuki ltd., average value of LN-TA is highest and DER is lowest of all the study variables. The std deviation value of LIQ is highest and NDTS is lowest. All variables have negative kurtosis value. NP/TA, LN-TA and GRO, have negative skewness value whereas DER, NDTS and LIQ have positive skewness.

1.1. Multi-Collinearity

The multi-collinearity is analysed by using correlation matrix for all the variables respectively for all selected companies.

M&M

The NDTS has high corelation with NP/TA and LN-TA i.e. higher than 0.80. Hence for conducting regression analysis, the NTDS is removed to avoid the problem of multi-collinearity problem.

Force Motors

Allthe independent variables are regression with dependent variable as no correlation value is higher than 0.80. Through correlation matrix, it was found that there is no collinearity between independent variables as no correlation value is higher than 0.80 Hence all the independent variables are regress able with dependent variable.

Ashokleyand

There was no collinearity between independent variables. Hence all the independent variables are regression with dependent variable as no correlation value is higher than 0.80.

Tata Motors

There is no collinearity between independent variables. Hence all the independent variables are regression with dependent variable as no correlation value is higher than 0.80.

Maruti Suzuki

There is no collinearity between independent variables. Hence all the independent variables are regression with dependent variable as no correlation value is higher than 0.80.

1.2. Regression Analysis

Table 2: Regression Model Fit

	R Square	Sig F
M&M	0.957	0.001
Force Mo	0.914	0.029
Ashok Ley	0.995	0.000
Tata Mo	0.603	0.437
MrSki	0.151	0.972

M&M

From the above table, we observe that the Multiple R and R square both are very high with value above 95 percent. The Adj R square at 0.9227 signifies that the independent variables selected have very high impact on the variation of Debt Equity ratio. This infers the explanatory variables are explaining the variances of dependent variables by approx above 92 percent.

Force Motors

Fromregression table, R square is high with value above 90. This infers the explanatory variables are explaining the variances of dependent variables by approx. 80 percent. The multi-regression model is significant at 5% level of significance using F test.

Ashok Leyland

From regression table, we observe R square is very high with value above 99. This infers the explanatory variables are explaining the variances of dependent variables by approx. 99 percent. The multi-regression model is significant at 5% level of significance using F test.

Tata Motors

From regression table, we observe that the R square ismoderately high with value above 60 percent. This infers the explanatory variables are explaining the variances of dependent variables by approx. 60 percent. The multi-regression model is not significant at 5% level of significance using F test.

Maruti Suzuki

From the above regression output table, we observe that the R square value is just 15 percent. This infers the explanatory variables are explaining the variances of dependent variables by approx. 15 percent. The multi-regression model is not significant at 5% level of significance using F test.

Table 3: Regression Coefficients

	M&M	Force Mo	Ashok Ley	Tata Mo	MrSki
Intercept	**1.242**	1.284	**6.667**	-7.333	-0.013
NP/TA	**2.836**	0.105	**-3.769**	-3.713	-0.309
LN-TA	**-0.171**	-0.180	**-0.499**	0.807	0.009
Gro	0.049	0.427	0.013	-0.176	0.049
NDTS	--	7.127	**-22.210**	-11.616	0.002
LIQ	**0.347**	-0.120	**-0.529**	-0.147	0.001

M&M

The independent variables, except Gro, are significantat 10% level of significance. The variables NP/TA, Gro and LIQ have positive relation with dependent variables, D-E ratio, with values 2.8364, 0.0491, 0.3471 per unit respectively. In contrast, LN-TA has negative relation dependent variables, D-E ratio, with values 0.170 per unit.

Force Motors

The independent variables are not significant at 10% level of significance. The variables NP/TA, Gro, NDTS have positive relation with dependent variables, D-E ratio, with values 0.1049, 0.4272, 7.127 per unit respectively. In contrast LN-TA and LIQ have negative relation dependent variables, D-E ratio, with values 0.1797 and 0.1198 per unit respectively.

Ashok leyand

The independent variables are significant at 10% level of significance, except Gro. The variables Gro have positive relation whereas NP/TA, LN-TA, NDTS and LIQ have negative relationship with dependent variable DER. The coefficient of NDTS with -22.21 and NP/TA with -3.79 are having very high negative as well as significant impact.

Tata Motors

All the independent variables are not significant at 10% level of significance. All variables except LN-TA have negative relationship with dependent variables, DER. The coefficient of NDTS with -11.62 and NP/TA with -3.7 are having very high negative, but not significant impact.

Maruti Suzuki

Theindependent variables are not significant at 10% level of significance. The variables LNTA, Gro, NDTS and LIQ have positive relation whereas NP/TA with negative relation with dependent variables, DER. It is also an exception in Maruti Suzuki that no variables have shown impact higher than coefficient of 0.5, with insignificant results.

1.1. Homogeneity of Variance of Residuals

The residuals plot of independent variable is used to verify the presence of homogeneity of variance of residuals.

M&M

All independent variables, except NP/TA and LIQ, residuals seem to have absence of homogeneity of variance as the residuals are equally on both positive and negative quadrants.Also, there is no visible trend or pattern in the plot. Hence, we can infer that the residuals are normally distributed.

Force Motors Ltd

All independent variables, except NP/TA and NDTS, residuals seem to have absence of homogeneity of variance as the residuals are equally on both positive and negative quadrants.Also, there is no visible trend or pattern in the plot. Hence, we can infer that the residuals are normally distributed.

Ashok leyand

All independent variables, except LIQ, residuals seem to have absence of homogeneity of variance as the residuals are equally on both positive and negative quadrants.Also, there is no visible trend or pattern in the plot. Hence, we can infer that the residuals are normally distributed.

Tata Motors

All independent variables, except NP/TA and Gro, residuals seem to have absence of homogeneity of variance as the residuals are equally on both positive and negative quadrants. Also, there is no visible trend or pattern in the plot. Hence, we can infer that the residuals are normallydistributed.

Maruti Suzuki

All independent variables residuals seem to have absence of homogeneity of variance as the residuals are equally on both positive and negative quadrants. Also, there is no visible trend or pattern in the plot. Hence, we can infer that the residuals are normally distributed.

5. Conclusion

The current study has examined the impact of financial performance on capital structure of Indian Automobile firms over 10 years. the study has used multivariate regression (OLS) model. Based on the data analysed and another diagnostics test, we can summarize the as below

Table 4: Relationship Summary

Variables	M&M	Force Mo	Ashok Ley	Tata Mo	MrSki	+ve/-ve
Profitability	**Highly Positive**	**Low Positive**	High Negative	High Negative	Low Negative	2/2
Asset Size	Low Negative	Low Negative	Low Negative	**Low Positive**	**Low Positive**	3/2
Business Growth	**Low Positive**	**Low Positive**	**Low Positive**	Low Negative	**Low Positive**	4/1
Leverage	--	**High Positive**	High Negative	High Negative	**Low Positive**	2/2
Liquidity	**Low Positive**	Low Negative	Low Negative	Low Negative	**Low Positive**	2/3

Variables	M&M	Force Mo	Ashok Ley	Tata Mo	MrSki	Sig/Not Sig
Profitability	Sig	Not Sig	Sig	Not Sig	Not Sig	2/3
Asset Size	Sig	Not Sig	Sig	Not Sig	Not Sig	2/3
Business Growth	Not Sig	Not Sig	Not Sig	Not Sig	Not Sig	0/5
Leverage		Not Sig	Sig	Not Sig	Not Sig	1/3
Liquidity	Sig	Not Sig	Sig	Not Sig	Not Sig	2/3

The descriptive analysis of the study variables results that M&M variable NDTS is most close to represent a normal distribution, whereas Force Mo variable has no clear variable close to normal distribution.

For M&M, the explanatory variables are explaining the variances of dependent variables by approx. 92 percent and the model is significant at 5% % level of significance using F test. The variables NP/TA, Gro and LIQ have positive relation with dependent variables, D-E ratio. In contrast, LN-TA has negative relation dependent variables. All variable, except Gro have significant impact. The variable showed no autocorrelation but NDTS showed correlation with NP/TA and LN-TA variables. The variables NP/TA and LIQ are showing the problem of heteroscedasticity characteristics.For Force Motors, the explanatory variables are explaining the variances of dependent variables by approx. 80 percent and model is significant at 5% level of significance using F test. The variables NP/TA, Gro, NDTS have positive relation with dependent variables, D-E ratio. In contrast LN-TA and LIQ have negative relation dependent variables, D-E ratio. The variables showed no multicollinearity, but the impact of explanatory variables is insignificant. The variables NP/TA and LIQ are showing the problem of heteroscedasticity characteristics.

Hence, there is no uniform result for any explanatory variables i.e., profitability, asset size, business growth, leverage and liquidity, in regard of direction of relationship and significance across the selected companies. It is only business growth rate that have shown maximum uniformity with 4 companies, except Tata Motors, low positive relationship with DER of the respective company.

Limitation:

The study has used data for ten-year recent years, so the regression analysis is not meeting certain assumption viz., normality and homogeneity. For robust analysis of capital structure determinants, external factors can also be included, which is under the scope of this study. Also, due to the focus of study only two major players of Indian automobile sector so, the interpretations cannot be generalised.

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