Capital Structure, Financial Performance and Agency Theory in the Automobile Industry in India

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The financial performance and capital structure decisions cannot be independent of each other in the light of agency costs of risk shifting behavior in times of financial distress. Against this backdrop, the study investigates the relationship between capital structure and financial performance of the Automobile Industry in India from 2001 to 2014. Panel data approach has been applied to find out if financial performance represented by Return on Assets (ROA) and Return on Equity (ROE) has any relationship with the capital structure. Debt Equity ratio (D/E ratio) represents the leverage or capital structure. Variables like growth, size, tangibility and CFCR are used as control variables. D/E ratio has a significant impact on the financial performance of the Automobile Industry. Out of the control variables, only growth had a positive and significant impact on the financial performance of the companies. Other variables like size, tangibility and CFCR were found to be insignificant in influencing the financial performance of the companies. The negative relationship between D/E ratio and financial performance signals agency problem between firm's equity investor and debt holders, where firms are likely to have high leverage, leading to low financial performance. Thus debt creates opportunities for shareholders to invest in a suboptimal manner. This can result in shifting risk from shareholders to lenders and of appropriating wealth in their favor. Due to risk shifting behavior, there is possibility of debt overhang. This leads to financial distress and higher agency costs to firms. Default risk leads to debt overhang and eventually bankruptcy and this becomes a cost.

Introduction

In their seminal papers, Modigliani and Miller (1958) and Miller and Modigliani (1961) provide a new perspective on optimum capital structure. The perfect market assumptions underlying Modigliani and Miller (1958) differ from the real world in which firms operate. The absence of the assumptions of MM theorem actually gives reasons for capital structure relevance in the real world. Sixty years since the propositions by Modigliani and Miller (1958) and (1963), many researchers tried to extend the theories related to corporate leverage. The focus of these theories was impact of the capital structure choice on the firm value and cost of

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capital, i.e., WACC. Each theory raised new questions and some of them paved the way for new theories. A review of theories reveals that the companies either have target debt ratio or follow the pecking order model or a mix of both the theories in India. But what about Agency theory existence in Indian companies?

The capital structure formulation is a critical decision for the Chief Financial Officer (CFO) of the company as it has a long-term impact on firm's financial performance. But the managers may not always work in benefit of the shareholders. Against this backdrop, Jensen and Meckling (1976) developed the agency cost theoretical model. The separation from ownership and control leads to conflict between shareholders and managers which gives rise to agency costs where managers work for their personal interest rather than shareholders' wealth maximization. Including debt in capital structure mitigates this agency problem to an extent as debt brings in external monitoring and the fixed interest payments curb the free cash flow from the hands of the managers. On these lines, a positive relationship is expected between capital structure and financial performance but as suggested by Jensen and Meckling (1976), the effect of leverage is not monotonic.

At very high debt level, the financial performance can change drastically as it brings in risk of financial distress. If there are signals of financial distress, shareholders can divert the management to take decisions, which in turn would take away funds from debt holders to equity holders. Due to this risk shifting behavior, firms tend to overleverage and this gives rise to conflict between shareholders and debt holders. Thus a negative relationship is expected between capital structure and financial performance. In the vein of agency cost theory argument, the present study investigates the relationship between capital structure and financial performance.

Rationale of Selecting Automobile Industry in India

Demographically and economically, India's Automotive Industry is well poised for growth, servicing both domestic and global markets. According to KPMG Auto Survey "The companies benefiting most from this evolving landscape would be the ones who prepare for the growing importance of green technologies, and who remain flexible enough to respond to the twin needs of private light transport and mass transport schemes". To cash in on these opportunities, companies will have to invest heavily in Technology, Research & Development, and Assets, which will further compel the companies to raise funds through debt or equity and strategize their capital structure to ensure financial benefits. Capital-intensive industries are compelled to purchase more property, plants and equipment to operate, resulting in a higher D/E ratio compared to the low-capital industries. Tripathi (2019) supported the fact that auto industry is cyclical in nature and is highly capital intensive which requires large financial commitments, and thus an important metric for evaluating auto companies' financial performance would be the D/E ratio. The managers of these firms will always face the dilemma whether one capital structure is better than the other. This creates interest to know if capital structure has an impact on the financial performance of the companies.

Financial performance is reactive and is affected by the way the manager finances its projects, which means the choice of debt and equity (capital structure) is very crucial. It is also a reflection of how persistently the firm managers have protected the interest of the investors even in the past and the present. The capital structure formulation is one of the most critical decisions taken by the CFO of the company as it has a long-term impact on firm's performance. Since the seminal work of Modigliani and Miller (1958) appeared, researchers have reviewed MM propositions and further provided their propositions, suggestions, and empirical evidence about the capital structure decisions and its impact on firm value.

Literature Review

Since the inception of the idea of separation of ownership from management in companies, the burning issue of agency cost has never settled down and even flags high. Various attempts of internal and external structures such as laws, ethics corporate governance and ownership dispersion have been developed to address this agency problem. The present study found a negative relationship between capital structure and financial performance. Similar results were confirmed by Chadha and Sharma (2015) who studied capital structure and firm performance of manufacturing firms, where capital structure had no impact on the Return on Assets (ROA) and Tobin's Q. However, it was negative and significantly correlated with Return on Equity (ROE). Dawar (2014) also concluded that "leverage had a negative effect on performance of Indian firms and argued that agency theory perspective in India given the underdeveloped nature of bond markets and dominance of state-owned banks in lending to corporate sector". He further argued that as "against privately owned institutions in developed economies, state-owned nature of lending in India has affected the way in which presence of loan creditors induces managers towards striving for superior corporate". Banerjee and De (2014) investigated the Determinants of Corporate Financial Performance in Indian Iron and Steel Industry and concluded that Leverage, debt serving capacity and size of the firm (log assets) were significant factors influencing the ROA of the firms. Jaisawal *et al.* (2013) found a negative relationship between firms' capital structure and financial performance measured by Net Profit Ratio (NPR), Return on Capital Employed (ROCE) and ROA, while a positive relationship with Gross Profit Ratio (GPR) and ROE. In addition, they assessed that capital structure was significant in determining the ROA and NPR of the cement industry, while insignificant in determining the ROE, GPR and ROCE. Mykhailo (2013) too found a negative relationship between capital structure and financial performance in Ukraine forms. Unlike the developed nations result, Nirajini and Priya (2013) found a positive relationship between capital structure and financial performance in trading firms in Srilanka. Salim and Raj (2012) investigated the relationship between capital structure and firm performance of Malaysian firms and found that ROA, ROE and EPS have negative relationship with Short-Term Debt (STD), Long-Term Debt (LTD), Total Debt (TD), while Tobin's Q had significant and positive relationship with STD and LTD. Shubita and Alsawalhah (2012) advocated that profitable firms depend more on equity as their main financing option and found similar results of negative relationship between capital structure and financial performance. Onaolapo and Kajola (2010) observed that D/E had a negative impact on the firm's ROA and ROE and provided evidence in support of agency

cost theory. ElSayed (2009) using three of accounting-based measures of financial performance (i.e., ROE, ROA, and gross profit margin) examined the nonfinancial Egyptian listed firms and found similar results of negative impact of debt equity decision on financial performance. Zeitun and Tian (2007) investigated the effect of capital structure on corporate performance for Jordanian companies and the results showed that a firm's debt ratio had a negative but significant impact on the ROA and Tobin's Q. They also found that the Short-Term Debt to Total Assets (STDTA) level has a significantly positive effect on the market performance measure (Tobin's Q). Abor (2005) evaluated the relationship between capital structure and profitability of listed firms on the Ghana Stock Exchange and the results revealed significantly positive relation between Short-term Debt to Assets ratio (SDA) and ROE, suggesting that profitable firms use more short-term debt to finance their operation. However, the results showed a negative relationship between long-term debts to assets and ROE. Pandey (2004) concluded a saucer shaped relationship between capital structure and profitability due to interplay of agency cost, tax shield and cost of external financing. Majumdar and Chhibber (1999) examined the relationship between the levels of debt in the capital structure and performance for Indian firms and found a significant but negative relationship. The study argued that corporate governance mechanisms, which work in the West, do not work in the Indian context unless the supply of loan capital is privatized. Chaganti and Damanpour (1991) studied capital structure and firm performance of US firms that corporate executives' shareholdings supplement the relationship between outside institutional shareholdings and firms' performance.

Limitations of the Existing Literature/Research Gap

Profitability has been explored widely as a determinant of capital structure in Indian firms and globally too. But there is a causal relationship between capital structure and financial performance and there are very few studies that have explored the impact of capital structure on financial measures like ROA and ROE that depicts the agency cost aspects in the Indian context. If the agency problems can be attributed to the fact that firms are incorporated, the financial performance and capital structure decisions cannot be independent of each other. Also, a plethora of research work has been conducted on pecking and tradeoff theory in Indian firms, but there are scanty studies on agency theory existence in Indian manufacturing companies. Thus, the present study is an attempt to explore this under-researched relationship in Indian Automobile firms with a focus on agency theory and build upon the existing literature by analyzing the relationship between D/E and firm's performance.

Data and Methodology

Sources of Data

The information relating to the capital structure and other variables for the leading automobile companies has been collected from the Prowess IQ – the latest version of Prowess CMIE Database.

Period of the Study

The auto industry saw tremendous changes post liberalization, and that too, after policies like Auto policy 2002, the growth of the automobile sector has been persistent. Discontinuation of foreign exchange neutrality and approval of 100% Foreign Direct Investment (FDI) via automatic route were a few of the impactful policy decisions which invited more foreign investors to India. Thus the ownership patterns also changed during this period. The period of 2001-2014 includes both pre- and post-financial distress (2008) period. Thus the relationship between capital structure and ownership structure has been explored for 14 years from 2000-2001 to 2013-2014, which includes all the major amendments of the Automobile Industry (Source: SIAM).

Sample Selection

Sample selection consists of listed Automobile companies on Bombay Stock Exchange (BSE) from 2000-2001 to 2013-2014. The preliminary list of sample companies was included 44 companies. Firms having missing values in either dependent variable or independent variables and inactive firms in terms of business operations throughout the period of the study were excluded. The firms were selected based on market capitalization, sales, and net profit and market share as per top BSE 100 AUTO under Auto 2/3 wheelers, Auto LCVs and HCVS and Auto Cars and Jeeps.

Theoretical Framework

Based on the empirical studies, two proxies for financial performance have been used in this study, ROA and ROE. Previous researchers who have used ROA and ROE as financial measures are listed in Table 1.

Table 2 presents the variables used in the study. In order to control the probable determinants of performance not captured by D/E ratio, there is a need to include some control variables in the model. These control variables are selected with reference to those included in empirical studies and are treated in a similar way like other variables.

Hypothesis

H_0: There is no significant relationship between capital structure and financial performance of the leading companies in the Automobile Industry in India.

For the dependent variable *ROA* and *ROE,* the null hypotheses (sub-hypotheses) have been tested for each of the explanatory variables and presented in Table 3.

Methodology

Panel data procedures were applied because the sample contained both cross-section data and time series data. Taking the sample companies as the representative of the automobile Industry, panel data regression has been used across 10 leading companies for 14 years. These companies cover 92% of the market share (SIAM, 2015). Gujarati *et al.* (2012) rightly suggests, "the use of panel data increases the sample size considerably and is more

Table 1: List of Researchers Who Used ROA and ROE as Financial Performance Measures	
ROA	**ROE**
Abor (2007)	Abor (2005)
Banerjee and De (2014)	Abor (2007)
Chadha and Sharma (2015)	Chadha and Sharma (2015)
Dawar (2014)	Dawar (2014)
Jackling and Johl (2009)	Jaiswal *et al.* (2013)
Jaiswal *et al.* (2013)	Kumar (2012)
King and Santor (2008)	Majumdar and Chhibber (1999)
Kumar (2012)	Onaolapo and Kajola (2010)
Onaolapo and Kajola (2010)	Shubita and Alsawalhah (2012)
Salim and Raj (2012)	Salim and Raj (2012)
Zeitun and Tian (2007)	

Table 2: Key Variables and Their Definitions			
Variables	**Definition**	**Measurement**	**D/I**
ROA	Return on Assets	PAT/Average total Assets; the returns cannot be only in terms of sales. It also has to get converted into profits. The ROA determines whether the company generates adequate return on the total assets used in business activities.	D
ROE	Return on Equity	PAT/Equity; according to Chhibber (1999) the net profit ratio does not have link with agency cost since the investment dimension is ignored in this profit measure. According to him, if the corporate governance issues are to be tracked an apt measure of profitability is ROE.	D
D/E	Debt Equity Ratio	Debt/Total Equity	I
GR	Growth	Growth (sales, prevy (sales))	C
SIZE	Size	LN(Total Assets)	C
TANG	Tangibility	Net Fixed Assets/ Total Assets	C
CFCR	Cash flow coverage ratio	Net operating cash flows/Total debt	C
Note: D = Dependent; I = Independent; and C = Control.			
Source: CMIE Prowess; Statistical Tool: E-Views			

Table 3: Sub-Hypotheses	
H_{01}: There is no significant relationship between debt equity ratio and financial performance (ROA).	H_{06}: There is no significant relationship between debt equity ratio and financial performance (ROE).
H_{02}: There is no significant relationship between the size of the firm and financial performance (ROA).	H_{07}: There is no significant relationship between size of the firm and financial performance (ROE).
H_{03}: There is no significant relationship between the Tangibility and financial (ROA)	H_{08}: There is no significant relationship between tangibility and financial performance (ROE).
H_{04}: There is no significant relationship between the Cash flow coverage ratio and financial performance (ROA).	H_{09}: There is no significant relationship between cash flow coverage ratio and financial performance (ROE).
H_{05}: There is no significant relationship between the growth and financial performance (ROA).	H_{010}: There is no significant relationship between growth and financial performance (ROE).

appropriate to study the dynamics of change". As panel data blends the inter-individual differences and intra-individual dynamics, they give better results compared to cross-sectional or time series data. It has more degrees of freedom and more sample variability than cross-sectional data or time series. It controls the impact of omitted variables, i.e., reduces omitted variable bias.

Methodology and Model Estimation

For analyzing the impact of capital structure (DE) on the financial performance of Automobile Industry as a whole, the following panel regression models have been developed:

Pooled Model (1)

$$ROA_{it} = \beta_0 + \beta_1 (DE)_{it} + \beta_2 (SIZE)_{it} + \beta_3 (TANG)_{it} + \beta_4 (CFCR)_{it} + \beta_5 (GR)_{it} + \varepsilon_{it}$$

Pooled Model (2)

$$ROE_{it} = \beta_{0i} + \beta_1 (DE)_{it} + \beta_2 (SIZE)_{it} + \beta_3 (TANG)_{it} + \beta_4 (CFCR)_{it} + \beta_5 (GR)_{it} + \varepsilon_{it}$$

Fixed Effect Model (FEM) (3)

$$ROA_{it} = \beta_{0i} + \beta_1 (DE)_{it} + \beta_2 (SIZE)_{it} + \beta_3 (TANG)_{it} + \beta_4 (CFCR)_{it} + \beta_5 (GR)_{it} + \mu_{it}$$

Fixed Effect Model (4)

$$ROE_{it} = \beta_{0i} + \beta_1 (DE)_{it} + \beta_2 (SIZE)_{it} + \beta_3 (TANG)_{it} + \beta_4 (CFCR)_{it} + \beta_5 (GR)_{it} + \mu_{it}$$

where

DE_{it} = Debt equity ratio of firm i at time t.

GR_{it}	=	Growth of firm i at time t.
DSC_{it}	=	Debt Service capacity of firm i at time t.
$PROF_{it}$	=	Profitability of firm i at time t.
$NDTS_{it}$	=	Non-debt tax shields of firm i at time t.
$SIZE_{it}$	=	Size of firm i at time t.
β_0	=	Common y-intercept.
β_{0i}	=	The y-intercept of firm i
$\beta_1 - \beta_5$	=	Coefficients of the concerned explanatory variables.
μ_{it}	=	The error term of firm i at time t.
ε_{it}	=	Error term of firm i at time t.

Data Analysis

Under the hypothesis, there are no groups or individual effects among the firms included in the sample; first estimated pooled OLS model is used. Since panel data contains observations on the same cross-sectional units over several time periods, there might be cross-sectional effects on each firm or on a set of group of firms. So Lagrange Multiplier test was applied to see which model is better pooled/ordinary least square or panel. According to the results presented in Tables 7 and 9, the lagrange multiplier test is significant at 5%, suggesting the suitability of panel models over the pooled model for both the measures of financial performance. Fixed effect redundant test was applied and the results of the test were significant at 5%, suggesting the use of FEM for both measures—ROA and ROE. Descriptive statistics, correlation matrix and VIF statistics values for all the variables used in the study have also been presented in this section. The data analysis has been done with the help of statistical software E-Views and SPSS.

VIF Statistics

The VIF value of all the variables presented in Tables 7 and 9 is under the acceptable limit. (V < 10) shows no multicollinearity problem.

Descriptive Statistics

Descriptive statistics of the variables used in the study are presented in Table 4. The maximum and minimum values and the standard deviations for each variable are also presented. Based on the mean values, it can be analyzed that the mean ROA is about 9% for all the selected automobile firms, while the mean ROE is about 22%. The results indicate ₹9 was earned as profit after tax for every ₹100 worth of total assets of the firms, while ₹22 was earned as PAT on every ₹100 issued share capital. As shown in Table 4, the ROA has a standard deviation of 8.64 with minimum value of –9.59, maximum value of 54.17 and ROE has a standard deviation of 20.74 with minimum value of –57.78, maximum value of 111.58.

Table 4: Descriptive Statistics							
	ROA	**ROE**	**DE**	**SIZE**	**TANG**	**CFCR**	**GROWTH**
Mean	9.321143	22.61571	0.558143	9.952804	29.21279	1.834500	17.16914
Median	7.515000	20.64500	0.440000	10.17399	28.33500	0.610000	16.92000
Maximum	54.17000	111.5800	3.550000	13.22551	56.80000	39.21000	124.3700
Minimum	−9.590000	−57.78000	0.000000	5.254365	3.540000	−2.200000	−69.31000
SD	8.647893	20.74100	0.517556	1.883013	11.46835	4.142300	24.44624
Sources: CMIE Prowess; statistical tool: E-Views							

The mean debt ratio is 0.5581. This indicates that 55.81% of the total assets have been financed through debt. Mean size of the firm is 9.95. The mean Tangibility is 29.21. This indicates that in the total assets, 29% were fixed assets. The mean growth (in sales) is about 17% and the mean cash flow coverage ratio is 1.83.

Correlation Analysis

Table 5 presents the correlation analysis among the variables. A combined table is presented for both the financial performance measures. *ROA* has a negative relationship with D/E ratio and is significant at 1% level. It is also negatively correlated with tangibility. It is positively related with the variables *CFCR* and growth. It is also positively correlated with size. *ROE* has a negative correlation with D/E ratio and *TANG* and was significant at 1%. It is positively related with two control variables *CFCR* and growth and significant at 1%.

Within the independent variables, *CFCR* is negatively correlated to D/E ratio and significant at 1%. It is also negatively correlated to *TANG* and significant at 5%. Also, growth is negatively correlated to D/E ratio and size and significant at 5% level. Thus, similar correlations are observed between the dependent and the explanatory variables for both the financial performance measures.

Results and Discussion

Dependent Variable: *ROA*

Results of fixed effect redundant test are presented in Table 7 and the χ^2 (df 9) (62.006/0.000) value indicates that the null hypothesis of no cross-section fixed effect is rejected and supports panel data FEM approach. Also, as seen in Tables 6 and 7, the value of R^2 for the fixed effects estimation model (62%) is higher than Pooled OLS Model (41%), indicating the existence of the omitted variables. FEM is selected over pooled model to have a meaningful analysis. The regression results of both OLS and FEM 1 and 3 are presented in Tables 6 and 7.

Table 7 reveals the results of fixed effect for model 3, and it has been found that there is a negative relationship between ROA and leverage (D/E) of the firm. These results are in line with Onaolapo and Kajola (2010) and Zeitun and Tian (2007). It suggests that to avoid agency conflicts between various parties, firms tend to have high debt portion and consequently a

Table 5: Correlation Matrix								
Particulars		***ROA***	***ROE***	***D/E***	***SIZE***	***TANG***	***CFCR***	***G R***
ROA	Pearson Correlation	1						
	Sig. (2-tailed)	–						
ROE	Pearson Correlation	0.880**	1					
	Sig. (2-tailed)	(0.000)	–					
DE	Pearson Correlation	−0.553**	−0.440**	1				
	Sig. (2-tailed)	(0.000)	(0.000)	–				
SIZE	Pearson Correlation	0.070	0.010	−0.071	1			
	Sig. (2-tailed)	0.409	0.906	0.407	–			
TANG	Pearson Correlation	−0.157	−0.218**	0.035	−0.150	1		
	Sig. (2-tailed)	0.064	(0.010)	0.682	(0.077)	–		
CFCR	Pearson Correlation	0.421**	0.301**	−0.353**	0.090	−0.186*	1	
	Sig. (2-tailed)	(0.000)	(0.000)	(0.000)	0.290	(0.028)	–	
G R	Pearson Correlation	0.297**	0.280**	−0.192*	−0.175*	0.070	0.086	1
	Sig. (2-tailed)	(0.000)	(0.001)	(0.023)	(0.038)	0.414	0.311	–
Note: ** Correlation is significant at 1% (2-tailed); * Correlation is significant at 5% (2-tailed); and *p*-values are in parenthesis.								
Source: CMIE Prowess; Statistical Tool: E-Views								

negative ROA. A negative relationship also suggests that increase in the D/E ratio will lead to decrease in financial performance. D/E ratio is also significant at 5% level. Thus, it can be concluded that capital structure has a significant impact on the ROA of the Indian Automobile firms. Thus, the null hypothesis that capital structure has no significant relationship with ROA is rejected.

Against the theoretical expectations, the present study provides evidence of a negative and significant relationship between *TANG* and *ROA*. Though it is significant, the negative relationship clearly suggests that the automobile companies could have utilized their fixed assets optimally to improve the ROA. *CFCR* also has negative relationship with ROA but insignificant at 5% level. Firm's cash flow coverage ratio in one-way reveals the debt appetite of the company. The inverse relationship with ROA suggests that as *CFCR* increases, debt level increases and ROA reduces or vice versa. This can be attributed to the higher finance

Table 6: Regression Results – Pooled Model (Dependent Variable – ROA)					
Variable	**Coefficient**	**Std. Error**	***t*-Statistic**	**Prob.**	**VIF**
Debt Equity Ratio (*DE*)	−7.112934	1.203312	−5.911131	0.0000	1.186
Size (*SIZE*)	0.185365	0.313620	0.591048	0.5555	1.066
Tangibility (*TANG*)	−0.081578	0.051356	−1.588478	0.1145	1.060
Cash Flow Coverage Ratio (*CFCR*)	0.477229	0.150479	3.171405	0.0019	1.188
Growth (*GR*)	0.074270	0.024351	3.050028	0.0028	1.083
C	11.67876	3.906723	2.989400	0.0033	
Total Panel (balanced) Observations	140				
Cross-Sections Included	10				
Periods Included	14				
R-Squared	0.413921				
Adjusted *R*-Squared	0.392053				
F-Statistic	18.92765				
Prob. (*F*-Statistic)	0.000000				
Durbin-Watson Stat.	1.350167				
Sources: CMIE Prowess; Statistical Tool: E-Views					

costs due to debt taken by the company, which reduces the ROA. The variable *size* has positive relationship, which means large-sized firms are more profitable, but insignificant in determining the ROA. The variable growth has a positive and significant relationship with ROA. Growth measured by the growth in sales shows the direct impact of sales on the financial performance of the company.

In Table 7, R^2 with 0.62 shows the combined effect of the model in explaining 62% variation in the ROA due to the explanatory variables. *F*-statistics value accepts the fitness of the model. Durbin-Watson test of 1.86 suggests there is no autocorrelation problem. Out of the five variables used in the FEM, three variables, debt equity ratio, tangibility and growth, have a significant impact on ROA of the Automobile Industry.

Dependent Variable: *ROE*

The results of the fixed effect redundant test are presented in Table 9 and the χ^2 (df 9) (51.74/ 0.000) value being significant at 5% indicates that the null hypothesis of no cross-section

Table 7: Regression Results – Fixed Effect Model (Dependent Variable – ROA)					
Variable	Coefficient	Std. Error	t-Statistic	Prob.	VIF
Debt Equity Ratio (DE)	−6.062606	1.127883	−5.375209	0.0000	1.186
Size (SIZE)	1.153740	0.747314	1.543850	0.1252	1.066
Tangibility (TANG)	−0.134699	0.062114	−2.168590	0.0320	1.060
Cash Flow Coverage Ratio (CFCR)	−0.018102	0.142361	−0.127155	0.8990	1.188
Growth (GR)	0.073617	0.020489	3.592913	0.0005	1.083
C	3.926196	8.067564	0.486664	0.6273	
Total Panel (balanced) Observations	140				
Cross-Sections Included	10				
Periods Included	14				
R-Squared	0.623637				
Adjusted R-Squared	0.581485				
F-Statistic	14.79476				
Prob. (F-Statistic)	0.000000				
Durbin-Watson Stat.	1.860635				
Lagrange Multiplier Test/ Prob.	43.782/0.000				
Redundant Fixed Effects Tests Statistic/Prob. Cross-Section F	7.73/0.0000				
Cross-Section χ^2 (df 9)	62.006/0.000				
Source: CMIE Prowess; Statistical Tool: E-Views					

fixed effect is rejected and supports panel data FEM approach. Also, the value of R^2 for the fixed effects estimation model (51%) is higher than pooled OLS model (29%), indicating the existence of the omitted variables. The results of regression analysis (pooled and panel) for model 2 and 4 are given in Tables 8 and 9.

Table 9 reveals the results of FEM 4, and it has been found that D/E ratio is significant at 5%. Thus the null hypothesis that there is no significant relationship between capital structure and ROE

Table 8: Regression Results – Pooled Model (Dependent Variable – *ROE*)					
Variable	**Coefficient**	**Std. Error**	***t*-Statistic**	**Prob.**	**VIF**
Debt Equity Ratio (*DE*)	–14.03718	3.166790	–4.432620	0.0000	1.186
Size (*SIZE*)	–0.202927	0.825364	–0.245863	0.8062	1.066
Tangibility (*TANG*)	–0.362765	0.135155	–2.684073	0.0082	1.060
Cash Flow Coverage Ratio (*CFCR*)	0.615404	0.396019	1.553976	0.1225	1.188
Growth (*GR*)	0.180574	0.064084	2.817757	0.0056	1.083
C	38.83827	10.28143	3.777516	0.0002	
Total Panel (balanced) Observations	140				
Cross-sections Included	10				
Periods Included	14				
R-Squared	0.294334				
Adjusted *R*-Squared	0.268003				
F-Statistic	11.17830				
Prob. (*F*-Statistic)	0.000000				
Durbin-Watson Stat.	1.209762				
Sources: CMIE Prowess; Statistical Tool: E-Views					

of the Automobile Industry is rejected. Capital structure (*D/E* ratio) also shows negative relationship with ROE. The variable *TANG* is insignificant and has a negative relationship with ROE. *CFCR* also has negative relationship with *ROE* and insignificant at 5% level. Firm's cash flow coverage ratio in one way reveals the debt capacity of the company. The inverse relationship with *ROE* suggests that as *CFCR* increases *ROE* reduces or vice versa. The variable size has positive relationship, which means large-sized firms are more profitable, but are insignificant in determining the ROE. The variable growth has a positive and significant relationship with ROE. Growth measured by the growth in sales shows the direct impact of sales on the ROE of the company.

In Table 9, R^2 with 0.51 shows the combined effect of the model in explaining 51% variation in the ROE due to the explanatory variables. *F*-statistics value accepts the fitness of the model. Durbin-Watson test of 1.64 suggests there is no autocorrelation problem.

Table 9: Regression Results – Fixed Effect Model (Dependent Variable – ROE)					
Variable	Coefficient	Std. Error	*t*-Statistic	Prob.	VIF
Debt Equity Ratio (*DE*)	−16.19398	3.079131	−5.259269	0.0000	1.186
Size (*SIZE*)	1.108702	2.040174	0.543435	0.5878	1.066
Tangibility (*TANG*)	−0.175976	0.169571	−1.037776	0.3014	1.060
Cash Flow Coverage Ratio (*CFCR*)	−0.412605	0.388646	−1.061647	0.2904	1.188
Growth (*GR*)	0.186368	0.055936	3.331795	0.0011	1.083
C	23.31748	22.02453	1.058705	0.2918	
Total Panel (balanced) Observations	140				
Cross-Sections Included	10				
Periods Included	14				
R-Squared	0.512364				
Adjusted *R*-Squared	0.457748				
F-Statistic	9.381323				
Prob. (*F*-Statistic)	0.000000				
Durbin-Watson Stat.	1.638511				
LaGrange Multiplier Test/Prob.	36.4042/0.000				
Redundant Fixed Effects					
Tests Statistic/Prob.					
Cross-Section *F*	6.2099/0.0000				
Cross-Section χ^2 (df 9)	51.74/0.000				
Sources: CMIE Prowess; Statistical Tool: E-Views					

Thus out of the five variables used in the FEM, two variables, D/E ratio and growth, have a significant impact on ROE of the Automobile Industry.

Conclusion

The study very clearly indicates that after controlling for variables such as firm size, tangibility, sales growth and cash flow coverage ratio, capital structure has a negative relationship with both ROA and ROE of Automobile Industry in India. Table 10 presents a summary of panel data results for both the financial performance measures ROA and ROE.

The observed negative relationship between capital structure and financial performance measured by ROA is in line with Agarwal and Knoeber (1996), Booth *et al.* (2001), Zeitun and Tian (2007), King and Santor (2008), Onaolapo and Kajola (2010), Banerjee and De (2013), Jaisawal *et al.* (2013), and Dawar (2014). The results of negative relationship between capital structure and ROE are also in line with the previous research works of Abor (2005), Onaolapo and Kajola (2010), Shubita and Alsawalhah (2012), Chadha and Sharma (2015), and Dawar (2014).

Table 11 presents the empirical mapping of observed relationships (as seen in Table 10) between all variables under study with previous research. However, the study reveals that D/E ratio and growth have a significant impact on the financial performance of the Automobile Industry unlike previous studies.

The negative relationship between capital structure and financial performance also leaves scope to argue that agency theory has to be seen with a different perspective in the Indian context, unlike the developed economies, given the underdeveloped nature of bond and debt markets.

Also, the negative relationship signals agency problem between firm's equity investor and debt holders/bondholders, where firms are inclined to have high leverage and this leads to lower financial performance. Figure 1 shows the relationship and the corresponding postulates of Agency theory.

Due to risk shifting behavior, the shareholders and managers engage in risky projects and increase the probability of financial distress and pass on the burden to debt holders. It also shows that the agency theory, which works for western economies where debt elevates the financial performance and solves agency problems between shareholders and managers, has to be looked at from a different angle in the Indian context, as the relationship is not positive.

Study Implications: The CFOs of these companies can consider this negative relationship before taking more debt or changing the debt equity mix. The debt holders can also consider the possible agency costs and risk shifting behavior of equity holders, if any, and act accordingly. Tangibility has an inverse relationship with financial performance as against expected positive relationship. The managers of these firms can focus on this issue, see how assets can be utilized more efficiently in a way that generates enough profits, and in return improve the financial performance (ROA and ROE). The empirical results provide evidence to finance
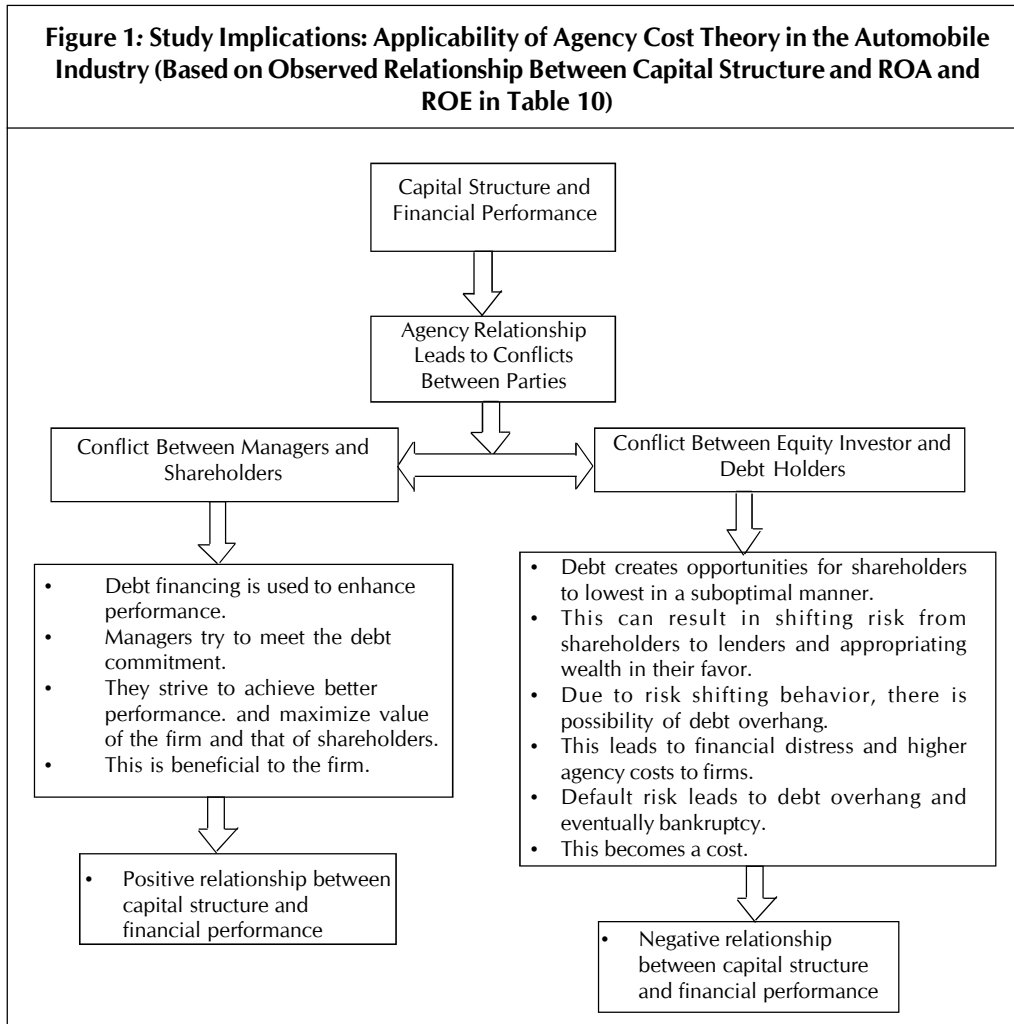
	Dependent Variable: ROA		Dependent Variable: ROE		Hypotheses	Hypotheses Results	
Result ⧅ Variables	Observed Relationship	Significant/ Insignificant at 5%	Observed Relationship	Significant/ Insignificant at 5%		With ROA	With ROE
D/E Ratio	–	Significant	–	Significant	*There is no significant relationship between debt equity ratio and financial performance*	Rejected	Rejected
SIZE	+	Insignificant	+	Insignificant	*There is no significant relationship between size and financial performance*	Not Rejected	Not Rejected
TANG	–	Significant	–	Insignificant	*There is no significant relationship between tangibility and financial performance*	Rejected	Not Rejected
CFCR	–	Insignificant	–	Insignificant	*There is no significant relationship between CFCR and financial performance*	Not Rejected	Not Rejected
GROWTH	–	Significant	–	Significant	*There is no significant relationship between growth and financial performance*	Rejected	Rejected
R^2	62%		51%				

Table 10: Summary of Panel Data Results for the Automobile Industry

experts to take more informed decisions and advise their diverse clients. The lenders can refer to the negative relationship between capital structure and financial performance and make more relevant financial decisions at their end. The practical study implications are presented in Figure 1.

Limitations/Future Research: The causal relationship between capital structure and financial performance with Agency model can be tested together. Along with the firm-specific variables,

Table 11: Empirical Mapping of the Observed Relationships with the Previous Studies		
Relationship Between Variables	**Empirical Evidence**	
	Negative Relationship	**Positive Relationship**
Debt Equity Ratio and *ROA*	Agarwal and Knoeber (1996), Booth *et al.* (2001), Zeitun and Tian (2007), King and Santor (2008), Onaolapo and Kajola (2010), Banerjee and De (2013), Jaisawal *et al.* (2013), and Dawar (2014)	Jackling and Johl(2009), Chadha and Sharma (2015)
Debt Equity Ratio and *ROE*	Onaolapo and Kajola (2010), Shubita and Alsawalhah (2012), Dawar (2014), Abor (2005) Chadha and Sharma (2015)	Jaisawal *et al.* (2013)
SIZE and *ROA*	NA	Zeitun and Tian (2007), Onaolapo and Kajola (2010), Banerjee and De (2013), Chadha and Sharma (2015), Dawar (2014)
SIZE and *ROE*	Chadha and Sharma (2015)	Abor (2005), Onaolapo and Kajola (2010), Shubita and Alsawalhah (2012), Dawar (2014)
TANGIBILITY and *ROA*	Zeitun and Tian (2007), Onaolapo and Kajola (2010), Chadha and Sharma (2015)	Dawar (2014)
TANGIBILITY and *ROE*	NA	Chadha and Sharma (2015), Onaolapo and Kajola (2010), Dawar (2014)
Growth and *ROA*	–	Abor (2005), Zeitun and Tian (2007), Onaolapo and Kajola (2010), Dawar (2014), Chadha and Sharma (2015)
Growth and *ROE*	–	Onaolapo and Kajola (2010), Shubita and Alsawalhah (2012), Chadha and Sharma (2015), Dawar (2014)

Figure 1: Study Implications: Applicability of Agency Cost Theory in the Automobile Industry (Based on Observed Relationship Between Capital Structure and ROA and ROE in Table 10)

```
                    ┌─────────────────────────┐
                    │  Capital Structure and  │
                    │  Financial Performance  │
                    └───────────┬─────────────┘
                                ▼
                    ┌─────────────────────────┐
                    │   Agency Relationship   │
                    │   Leads to Conflicts    │
                    │     Between Parties     │
                    └───────────┬─────────────┘
                                ▼
    ┌──────────────────────┐   ◄──►   ┌──────────────────────────┐
    │ Conflict Between     │          │ Conflict Between Equity  │
    │ Managers and         │          │ Investor and Debt Holders│
    │ Shareholders         │          │                          │
    └──────────┬───────────┘          └────────────┬─────────────┘
               ▼                                    ▼
```

Conflict Between Managers and Shareholders:
- Debt financing is used to enhance performance.
- Managers try to meet the debt commitment.
- They strive to achieve better performance. and maximize value of the firm and that of shareholders.
- This is beneficial to the firm.

Conflict Between Equity Investor and Debt Holders:
- Debt creates opportunities for shareholders to lowest in a suboptimal manner.
- This can result in shifting risk from shareholders to lenders and appropriating wealth in their favor.
- Due to risk shifting behavior, there is possibility of debt overhang.
- This leads to financial distress and higher agency costs to firms.
- Default risk leads to debt overhang and eventually bankruptcy.
- This becomes a cost.

- Positive relationship between capital structure and financial performance

- Negative relationship between capital structure and financial performance

inclusion of country-specific variables like GDP, inflation rates, tax rates, etc. can give a true picture of the firms operating in political and economic environment of India. Also variables affecting the capital market can give a market-oriented result for listed companies.

Joint impact of capital structure and ownership structure on financial performance with more complex models and larger sample can give more robust results and clarification and a new angle of research to such complex topics. An extensive study of the nonfinancial corporate sector's preference of debt/equity mix through surveys of CFOs of these companies can give a more realistic picture of capital structure decisions. A comparative analysis of factors affecting the capital structure and financial performance pre and post recession period of 2008 can give a more comprehensive picture of the financial decisions. Indian listed Companies have adopted IFRS post 2015-16. So the impact of capital structure on financial performance can also be studied post this period and see if there is any dramatic change in the results due to IFRS adoption.■

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