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CAPITAL STRUCTURE AND ITS DETERMINANTS OF THE AUTOMOBILE COMPANIES IN INDIA: AN EMPIRICAL ANALYSIS

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ABSTRACT

This study examines the Capital structure and its determinants of Automobile companies listed in India using panel data analysis. The data was taken from secondary data source named as "Industry; financial aggregates and ratios" (PROWS) of center for monitoring Indian economy (CMIE) covers 58 Indian Automobile companies listed on the Bombay Stock Exchange covering the period from 1997-98 to 2010-14 (17 years). Fixed effects regression model was used for the analysis of penal data of sample companies The empirical Results shows that the variables of profitability, size, tangibility, growth, and non-debt tax shield are negatively related with leverage and risk and liquidity are positively related with leverage. Profitability is statistically significant determinants of capital structure. While on the contrary, size, tangibility, growth, risk, non-debt tax shield and liquidity are statistically insignificant determinants of capital structure. The results are generally consistent with theoretical predictions as well as previous research papers. This paper adds to the existing literature on the relationship between the firm specific factors and leverage

KEYWORDS: *Automobile firms, Capital Structure, Leverage, Pecking Order Theory.*

INTRODUCTION

In finance, capital structure is the most debatable topic and continues to keep researchers pondering. Capital structure refers to the mix of debt and equity used by a firm in financing its assets. The capital structure decision is one of the most important decisions made by financial management. The capital structure decision is at the centre of many other decisions in the area of corporate finance, like dividend policy, financing of mergers and acquisition, project financing, etc. One of the many of objectives of a corporate financial manager is to ensure the lower cost of capital and thus maximize the wealth of shareholders. Selection of an optimal capital structure is always a critical issue for every firm.

Debate on capital structure started by David Durand (1952) developed two theories of capital structure, viz., Net Operating Income (NOI) and Net Income (NI). These theories were based on the assumptions of (i) perfect capital markets, (ii) no growth in operating income, (iii) 100% dividend payout ratio, (iv) debt and stock can be sold to repurchase the other security, (v) constant business

risk, (vi) homogeneous expectations of investors, and (vii) cost of debt ($k_{d)}$ remains constant. In NOI theory, they suggested, cost of equity capital increased with leverage, but keep the weighted average cost of capital (WACC) remained constant. Thus, both the value of a firm and its cost of capital were independent of its capital structure. The NI theory suggested that costs of debt and equity remained constant irrespective of change in degree of leverage. Since cost of debt is less than cost of equity, increase in leverage will gradually decrease the WACC and as a result, the value of a firm increases with increase in leverage.

Late 1950's witnessed significant developments in the field of corporate finance. Financial analysis techniques were designed to help the firms in maximizing their profits. Growth of stock markets, development of computers, valuation models and models for managing inventories, cash, accounts receivable and fixed assets, played an important role in shifting the focus from outside to inside point of view. These developments completely changed the role of a financial manager. At the time of these rapid changes in corporate finance, came the most stunning, controversial and path breaking works of Franco Modigliani and Merton Miller (MM). They can rightly be called the father of modern finance and their path breaking articles transformed the study of finance from an institutional orientation to an economic orientation. Miller and Modigliani (1958) opined that if there is no bankruptcy cost and tax benefit, then firm's value would be independent of capital structure. But in reality there is a tax benefit of debt and bankruptcy cost so firm's value affected by the capital structure. This issue tends to an optimal capital structure as presented by different theorists, but Modigliani and Miller (1963) argued there is an irrelevance of capital structure in value of firm. The others are Agency cost theory of capital structure, the static trade-off theory, pecking order theory and the signaling theory.

Under "the trade-off theory of leverage", firms face trade-off between tax advantage of debt and its bankruptcy costs. Up to the point where marginal tax benefit is higher than the marginal bankruptcy cost, debt will increase the firm's value. But by increasing the amount of debt marginal bankruptcy cost increases and the point at which marginal cost equate the marginal tax benefit it is a point of optimal capital structure. According to pecking order theory a firm do not follow the pattern of optimal capital structure in fact firms finance their business in the pattern of internal sources to external sources of finance (Myers and Majluf, 1984). This theory explains, first, management prefers the internal equity financing, and then debt financing and finally external equity financing.

These theories suggest that the firms select capital structure depending on the various costs and benefits associated with debt and equity financing. The empirical work in this area has lagged behind the theoretical work, particularly in developing countries. If one look at the Indian private corporate sector, it can see that the relationship between a firm's financial leverage and its profitability, size, tangibility, growth, risk, non-debt tax shield and liquidity in Indian Automobile companies.

AUTOMOBILE INDUSTRY IN INDIA

Starting its journey from the day when the first car rolled on the streets of Mumbai in 1988, the Indian automobile industry has demonstrated a phenomenal growth to this day. The Indian automobile industry is the front line of the country's technology based industry and is one of the fast growing industries in recent times. A highly sophisticated and out shine sector, the Indian Automobile Industry is expected to offer the world's third largest auto market by 2030, after china and the USA. In fact, Automobile industry of India has made tremendous progress, particularly after introduction of the economic reforms in July, 1991 with liberalized policy Government and potential market that India offers, several lending international players in automobile field have shown interest in the Indian Automobile industry and a number of joint ventures have already been approved by the government of India in this sector.

Today, the Indian automobile industry presents a galaxy of varieties and models meeting all possible expectation and globally established industry standards, can produce a diverse range of vehicles under three broad categories namely; cars, two-wheelers and heavy vehicles. Some of the leading names echoing in Indian automobile industry include Maruthi Suzuki, Tata motors, Hero Honda, and Hindustan Motors in addition to a number of others. The automobile sector is the seventh largest in the world. Easy availability of finance and rising income levels are encouraging the middle class population to upgrade their two wheelers to a car. Besides, the growing organized used car market has also been a positive growth factor in the used car market of the country. Driven by the above factors, the used cars market is anticipated to grow at a compound annual growth rate (CAGR) of 16 per cent during 2013-17, highlighted the RNCOS report titled, "Booming Used Car Market in India Outlook 2017".

The passenger vehicles production in India touched 3.53 million units in 2014 and is expected to reach

10 million units by 2020-21. The Industry is estimated to grow at a CAGR of 13 per cent during 2020-21. In addition, the industry recorded exports worth US$ 9.3 billion in 2012-13 and is projected to touch US$ 30 billion by 2020-21, according to data from "Automotive Component Manufacturers Association" (ACMA). The foreign direct investment (FDI) in flows into the Indian automobile industry during April 2000 to October 2013 was recorded at US$ 9079 billion, amounting to 4 per cent of the total FDI inflows (in terms of US$), as per data published by Department of Industrial Policy Promotion (DIPP), Ministry of Commerce, Government of India.

India also expected to emerge as a centre for producing compact superbikes as India customer's progress to the next level of biking. Several global and Indian bike makers plan to utilize Indian's mass-production base of 16 million two-wheelers to roll out sports bikes in the 250 cc capacity. India has significant cost advantages; auto firms save 10-25 per cent on operations in India as compared to Europe and Latin America. A large pool of skilled manpower and a growing technology base are some of the leading factors.

The government aims to develop India as a global manufacturing as well as research and development (R&D) hub. There has been a wide array of policy support in the form of sops, taxes and FDI encouragement. The world's cheapest car (Tata Nano) has directed focus towards the low-income market. Bajaj Auto, Hero Honda and Mahindra and Mahindra (M&M) jointly plan to develop a technology for two-wheelers to run on natural gas and further the electric cars are likely to be a sizeable market segment in the coming decade.

OBJECTIVES OF THE PAPER

The main objective of the present paper is to investigate empirically the impact of leverage on the profitability, size, tangibility, growth, risk, non-debt tax shield and liquidity in the Indian Automobile firms and testing Pecking order theory on the observed relationship order to analyze their consistency. More specifically, the following are the objectives of the study:

(i) To find out the determinants of the financial leverage in Indian Automobile firms.

(ii) To study the relationship between leverage and its determinants.

HYPOTHESES

The objective of the researcher in the present study is to test the pecking order theory that provides positive as well as negative relationship between leverageand different factors, so the following hypotheses have been developed according to the above said theory:

H_1: Profitability should have a negative impact on leverage.

H_2: Size should have a negative impact on leverage.

H_3: Tangibility should have a negative impact on leverage.

H_4: Growth should have positive impact on leverage.

H_5: Risk should have a negative impact on leverage.

H_6: Non-debt tax shield should have a negative impact on leverage.

H_7: Liquidity should have a negative impact on leverage

Many of the research works have been conducted over the period to evaluate the factors determining capital structure of firm. **Gupta (1969)** confirmed that total debt ratios were positively related to growth and negative related to size. **Toy et. al. (1974)** found higher level of operating risk is associated with higher debt ratio, while financial leverage is indirectly tied with return on investment. **Bhat, Ramesh (1980)** studied the impact of size, growth, business risk, dividend policy, profitability, debt service capacity and the degree of operating leverage on the leverage ratio of the firm. Business risk (earning instability), profitability, dividend payout and debt service capacity were found to be significant determinants of the leverage ratio. **Marsh (1982)** observed that positive relation between firm size and debt ratio and fixed assets and debt ratio and negative relation between risk and debt ratio. They concluded that the timing and market condition were different for debt issue and equity issue. The firm's past history and market condition heavily influence the choosing between debt and equity financing.

Myers and Majluf (1984) found that the firm size had a positive relation with capital structure, while profitability may have either a negative or positive relation. A positive relation between profitability and capital structure is consistent with the static trade off theory. Whereas it's negative relation supports the pecking order theory. **Titman and Wessel (1988)** incorporated eight independent variables, viz., and collateral value of asset, non-debt tax shield, growth, product uniqueness, industry classification, size, volatility, and profitability as determinants of capital structure. They found that the product uniqueness and profitability were statistically significant and negatively related to leverage ratio. Their empirical estimate for product uniqueness supported that the firm that could potentially impose high cost on their

customers, workers and suppliers in the event of liquidation had lower debt ratios. **Harris and Raviv (1991)** concerning industry characteristics and capital structure. They found that leverage increased with fixed assets, non-debt tax shields, growth opportunities, and firm size and decrease with volatility, advertising expenditure, research and development expenditure, bankruptcy probability, profitability and uniqueness of the product.

Rajeswararao and Sadanandam (1995) found that increase in debt-equity ratio, followed by a decrease in EBIT/capital employed ratio, indicating poor profitability, while increasing debt-equity ratio. It might run into a greater risk, if the return on capital employed continues to below. **Rajang and Zing Ales (1995)** focused on four factors as determinants of capital structure, viz.; tangibility of assets, investment opportunities (growth), firm size and profitability. The authors found that the tangibility of assets and the size were positively related to leverage and growth opportunities and profitability were negatively related to leverage and statistically not significant. They also observed that firm in which the state had a majority ownership appeared to have higher leverage. **Ram Kumar Kakani (1999)** found that the leverage ratio was positively related with the collateral value of the assets, size of the companies and is negatively related with the profitability and non-debt tax shields. **Manos et. al. (2001) f**ound that liquidity had a positive impact, while intangibility and profitability, group debt and group sizes had a negative effect on the capital structure decisions of group-affiliated firms. **Booth et. al. (2001)** analyzed capital structure choice of firms in 10 developing countries (India, Pakistan, Thailand, Malaysia, Turkey, Zimbabwe, Mexico, Brazil, Jordan and Korea) by using both firm specific attributes and macroeconomic indicators. Profitability was found the most successful independent variable and negatively related to leverage.

In overall, the size and tangibility were observed to be positively related with leverage ratio. The results of risk variable were mixed. All three measure of leverage ratio vary negatively with the equity market capitalization; except for the long-term market-debt ratio, the debt ratios vary positively with the proportion of liquid liabilities to GDP. **Ozkan (2001)** found that the profitability, liquidity, non-debt tax shield and growth opportunities on leverage were observed negative while, the size was found positively related to leverage with limited support. **Bhaduri and Saumitra N (2002)** investigated the Indian corporate sector from 1989 to 1995. They found that the coefficients on the growth factor were significant positive to the total borrowings, which indicates the fact that growth opportunities add value to the firm and thus increase leveraging capacity.

While on the contrary, collateral value and size have a negative but insignificant relationship with borrowing. Finally, there was strong evidence supporting industry effects in explaining observed variations in capital structure across firms. **Bhole and Mahakud (2004)** found that firm size, growth rate, collateral value of assets were positive related with the leverage ratio and profitability, liquidity, non-debt tax shields were negative related with the leverage ratios. **Mohan Sahoo and Omkarnath (2005)** found that non-debt tax shield, asset structure, firm size and profitability of the LPLCOs were highly significant factor that determines firm's total debt in capital structure, among these, non-debt tax shields is negatively related to total debt, while Asset structure, firm size, profitability are positively related to total debt.

Narender and Abhinav Sharma (2006) found that the tangibility of assets plays a significant role in determining the leverage of the PEs, as the result for non-debt tax shield and Tax, inferring that the PEs are not utilizing debt to pay less tax, instead using their internal resources for the PEs in expansion and financing. **Mallikarjunappa and Carmeltia Goveas (2007)** found that debt service capacity, and liquidity had inverse relationship with the debt-equity ratio, while non-debt tax shields and Business risk had direct relationship with the debt-equity ratio. **Santi Gopal Maji and Santanu Kumar Ghosh (2007)** suggested that size was positive association between equity and debt capital. Profitability is significant negative association with debt ratio. Tangible Assets found to be positive and statistically significant with leverage and not disentangle the relationship between dividend and leverage. **Ravinder Vinayek and Anju Gupta (2010)** found that the variables like profitability, capital intensity and collateral value of assets were significant to the market value debt equity ratios in pre-liberalization period and post-liberalization period.

Age is tended to be insignificant to the market to book ratio for whole period. Size and non-debt tax shield are found to be a significant determinant to book value debt-equity ratios in pre-liberalization period. **Inder Sekhar Yadav et. al. (2010)** found that cost of borrowing, the cost of equity, size of firm, collateral value of assets and profitability were the major determinants of capital structure of corporate firms in India and also found to be significant indicating a movement towards the optimal level of leverage ratio. **Liaqat Ali (2011)** found that the

variables of size, non-debt tax shields, and tangibility had highly significant positive relationship with leverage, while growth and profitability had highly significant negative relationship debt ratio.

Mohan Raj (2011) found that tangibility was inversely related with leverage and non-debt tax shield proves to be statistically significant capital structure decisions and size of the firm had negatively relationship with leverage and the liquidity played important role in determining capital structure. **Amsaveni and Gomathi (2012)** found that business risk and liquidity were negatively related to the leverage, while tangibility, growth, size, non-debt tax shields exhibit positive relationship with leverage. Hence, the result is partially supportive of the pecking order and trade off theory. **Palvann and Sekhar (2013)** found that the factors such as size, growth, earning risk, non-debt tax shields, business risk, debt service capacity and leverage were determined the capital structure of co-operative sugar mills and all these variables had significantly contributing to debt equity.

METHODOLOGY OF THE STUDY

This paper uses panel data to investigate the linkage between leverage and the firm specific factors. To draw valid conclusions, a period of minimum ten is required for this type of studies. Here, this study covers a period of 17 years from 1997-98 to 2010-2014.

Three alternative methods of penal data regression, i.e., pooled-ordinary least squares (OLS) method, fixed effects method, and random effects method can be employed to estimate the model of leverage. The simple pooled OLS method assumes no firm or time-specific effects and if they are, then least squares estimators will be a compromise, not likely to be a good predictor of the cross-section units over a period of time.

Source of Data:-

The present study is based on secondary data collected from the corporate database (PROWS) of the Centre for Monitoring Indian Economy (CMIE) and then various issues of magazines and journals, working papers and newspapers were also accessed for the relevant.

Statistical Tools:-

An evaluation of factors determining capital structure of Indian Automobile firms based on the following statistical tools was used: Summary Statistics, Correlation Analysis, multiple regressions Analysis, "t" test, "f" test and Analysis of variance (ANOVA) and SSPS-20 software is used for the analysis.

Ordinary least square (OLS) Regression Model:-

The following Regression model has been established:

$$LV = \beta 0 + \beta 1\ (PRO) + \beta 2\ (SIZ) + \beta 3\ (TANG) + \beta 4\ (GRO) + \beta 5\ (RISK) + \beta 6\ (NDTS) + \beta 7\ (LIQ) + \varepsilon$$

Where, $\beta 0$ = Constant's coefficient, $\beta 1$- $\beta 7$ = Regression coefficients for independents variables

LEV = Leverage, PRO= Profitability, SIZ = Size, TANG = Tangibility, GRO = Growth,

RISK = Risk, NDTS = Non-debt tax shield, LIQ= Liquidity, ε= Error Term

Determinants of Variables' Explanation:-

Leverage is the most commonly used measure of financial leverage i.e., Debt-equity Ratio is used as dependent variable. The debt-equity ratio is computed as the ratio of long term debt and equity consist of share capital and reserves. Book values and figures have been used to measure both debt and equity. The same measurement used by Mohan Raj (2011) in their analysis. It is calculated as: Leverage (LEV) = Long term debts / net worth.

Profitability is defined as earnings before interest, taxes and dividend and divided by book value of assets. This measure has been used by Titman and Weasels (1988), Ozkan (2001), Mohan Sahoo and Omkarnath (2005), Mallikarjunappa and Carmelite Goveas (2007) and Ali (2011). The pecking-order theory postulates that firms with higher profits (high internally generated funds) prefer to borrow less because it is easier and more cost effective to finance from internal fund sources. So, as per this theory, there will be a negative relation between leverage and profitability. In contrast, trade-off theory suggested that this relationship would be positive. Since profitable firms are less likely to go bankrupt, and hence can avail more debt at cheaper rates of interest. Profitability is calculated as: Profitability (PRO) = EBDITA/ Total Assets.

Firm size is measured by taking the natural logarithm of the total assets. The same measurement used by Marsh (1982), Mohan Sahoo and Omkarnath (2005), and Ali (2011). The trade-off theory expects a positive relation between leverage and firm size. Since larger firms are likely to be more diversified, have more stable cash flows; lower bankruptcy risk, and have relatively easier access to credit markets. Firm size has been found to be a positive determinant of leverage. However, with respect to the pecking order theory, larger firms are expected to have lower information asymmetries making equity issues more attractive, the relationship between firm size and leverage should be negative. The size of the firm can be calculated either by log of sale or by log of assets. The researcher in this study measured the firm's size by log of

total assets. So the firm's size is calculated as: Size (SIZ) = Log of total assets.

Tangibility is measured as a ratio of net fixed assets divided by total assets. The same Proxy used by Marsh (1982), Harris and Raviv (1991), Rajang and Zing ales (1995), Booth et. al. (2001), Mohan Sahoo and Omkarnath (2005), Mallikarjunappa and Carmeltia Goveas (2007), Inder Sekhar Yadav et. al. (2010),Mohan Raj (2011) and Ali (2011). Since tangible assets are used as collateral, firms with large amount of fixed assets can borrow on favorable terms by providing the security of these assets to the lenders. Therefore, a high ratio of fixed assets-to-total assets should have a positive impact on firm leverage. Empirical as well as theoretical studies generally predict a positive relation between leverage and asset tangibility. So the tangibility of fixed assets can be calculated as: Tangibility (TANG) = Net Fixed Assets / Total Assets.

Growth is measured as the change in total Sales between two consecutive years divided by previous year total Sales. The same measurement used by Titman and Wessel (1988), Mohan Sahoo and Omkarnath (2005). Growth opportunities are viewed as intangible assets of firm. Firms with significant future growth opportunities are likely to face difficulties in raising finance from debt market because intangible assets are not fully collateral stable. Thus, firms with high intangible growth opportunities will use more of equity rather than debt in their capital structure. However, pecking order theory suggests that firms with high growth opportunities are anticipated to have higher information asymmetries, and are expected to have more of debt and less of equity in their capital structure. It is calculated as: Growth (GRO) = Change in total sales/ Total sales (S-S-t " S-t).

Business Risk is defined as Absolute variation in profitability. This measure has been used by Marsh (1982), Titman and Wessel (1988), Booth et. al. (2001). The level of risk is said to be one of the primarydeterminants of a firm's capital structure. The tax shield, bankruptcy cost theory of capital structure determines a firm's optimal leverage as a function of business risk. Given agency and Bankruptcy costs, there are incentives for the firm not to fully utilize the tax benefits of 100% debt within the static framework model. Both agency and bankruptcy cost theories suggest the negative relation between the capital structure and business risk. It is calculated as: Risk = Absolute variation in profitability.

Non-debt tax shield is defined as a ratio of total annual depreciation to total assets. The same measurement used by Titman and Wessel (1988), Ozkan (2001), Inder Sekhar Yadav et. al. (2010), and Ali (2011). Non-debt tax shields such as tax deduction for depreciation and investment tax credits are considered to be the substitutes for tax benefits of debt financing. Therefore non-debt tax shields are expected to have negative impact on leverage. It is calculated as: Non- debt tax shield (NDTS) = Depreciation/Total assets.

Liquidity is defined as current assets divided by current liabilities. The same measurement used by Rajang and Zing Ales (1995), Ozkan (2001), Mallikarjunappa and Carmeltia Goveas (2007), Mohan Raj (2011). There are two different opinions on the association between liquidity and capital structure: First view implies a positive significant relation that is consistent with trade off theory. Companies with more liquidity (more current assets) tend to use more external borrowing, because of their ability in paying off their liabilities. Second view points to a negative significant relation that is consistent with the pecking order theory, arguing that companies with more liquidity will decrease external financing, relying on their internal funds. Thus, liquidity ratios may have a mixed effect on the capital structure decisions. It is calculated as: Liquidity (LIQ) = current assets / current liabilities.

DATA ANALYSIS AND INTERPRETATION

Table 1: Descriptive Statistics of Leverage and Explanatory Variables of Indian Automobile Companies (N =14)

Variables	Minimum	Maximum	Mean	Std. Deviation
LEV	0.34	1.13	0.7194	0.28445
PRO	0.06	0.16	0.1138	0.02872
SIZ	4.63	5.24	4.8336	0.20507
TANG	0.21	0.39	0.2924	0.05481
GRO	-0.05	0.34	0.1411	0.13684
RISK	-0.05	0.05	-0.0002	0.02863
NDTS	0.02	0.34	0.0558	0.08115
LIQ	0.54	1.22	0.8925	0.27668

Source: Computed from the CMIE Prowess Database.

Table-1 shows descriptive statistics of Automobile companies in India as follows. First, the mean of leverage is 0.7194 times with the standard deviation of 0.28445 times. The maximum value of leverage is 1.13 times and the minimum value of leverage is 0.34 times. Second, the mean of profitability is 11.38 per cent with the standard deviation of 2.872 per cent. The maximum value of profitability is 16 per cent and the minimum of profitability is 6 per cent. Third, the mean of size is 4.8336 with the standard deviation of 0.20507. The maximum value of size is 5.24 and the minimum of size is 4.63. Fourth, the mean of tangibility is 0.2924 with the standard deviation of 0.05481. The maximum value of tangibility is 0.39 and the minimum of tangibility is 0.21. Fifth, the mean of growth is 14.11 percent with the standard deviation of 13.684 per cent. The maximum value of growth is 34 per cent and the minimum value is -5 per cent. Sixth, the mean of risk is -0.02 per cent with the standard deviation of 2.863. The maximum value of risk is 5 per cent and the minimum value is -5 percent. Next, the mean of non-debt tax shield is 5.58 per cent with the standard deviation of 8.115 per cent. The maximum value of non-debt tax shield is 34 per cent and the minimum value is 2 per cent. Finally, the mean of liquidity is 0.8925 with the standard deviation of 0.27668. The maximum value of liquidity is 1.22 and the minimum value of liquidity is 0.54.

Table-2: Correlation Matrix for all the dependent and independent variables of Automobile Companies in India

variable	LEV	PRO	SIZ	TANG	GRO	RISK	NDTS	LIQ
LEV	1							
PRO	-0.625*	1						
SIZ	-0.474	-0.162	1					
TANG	0.589*	-0.446	-0.317	1				.
GRO	-0.613*	0.469	0.359	-0.195	1			
RISK	-0.006	0.497	-0.059	0.168	0.315	1		
NDTS	-0.226	-0.012	0.144	-0.205	-0.27	-0.212	1	
LIQ	0.673**	0.000	-0.888**	0.126	-0.354	-0.352	-0.308	1

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Computed from the CMIE Prowess Database.

Table-2 indicates correlation matrix of the variables used in the current study. It indicates that Profitability is negatively correlated with leverage with coefficient value as -0.625. It accepts the consistency with pecking order theory. Size also shows a negative correlation with coefficient value as -0.474 and accepts the pecking order theory while the tangibility shows a positive correlation with leverage shows 0.589 values of coefficient and rejects pecking order theory. Growth shows negative correlation with leverage showing -0.613, value of coefficient and rejects pecking order theory. Risk and non-debt tax shield are negatively correlated with leverage shows -0.006 and -0.226 values of coefficient and accepts pecking order theory, while liquidity shows negative correlation with leverage showing 0.673 and rejects pecking order theory in the firms of Automobile firms of India.

Table-3: Model Summary for Multiple Regression analysis of Automobile Companies in India

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.958	0.918	0.822	0.11993

Data Source: *Computed from the CMIE Prowess Database.*

The output generated from multiple regressions has been summarized in table-3. It can be deduced from the data that the *R* Square indicates that 91.8 per cent variation in leverage is explained by profitability, size, tangibility, growth, risk, non-debt tax shield and liquidity, while the remaining 8.2 per cent is explained by unobserved factors. The adjusted-R^2 is 9.6 per cent lower than the $R^2$and is indicated as 82.2 per cent.

Table 4: ANOVA for the Debt-equity ratios of Automobile Companies in India

Model		Sum of Squares	Df.	Mean Square	*F*	Significance.
1	Regression	0.966	7	0.138	9.589	0.007
	Residual	0.086	6	0.014		
	Total	1.052	13			

Source: Computed from the CMIE Prowess Database.

Table-4 presents the test results of ANOVA, which explains that whether the model as a whole is significantly better at predicting the outcome than using the mean as a best guess. From the data it can be said that this analysis is significant because the P-value of 0.007 is less than the alpha level of 0.05.

Table 5: Regression results of constant coefficient model (OLS) of selected Automobile Companies in India

Model		Un-standardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		Beta	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	3.048	3.220		0.947	0.380	-4.831	10.927
	PRO	-7.969	2.686	-0.805	-2.967	0.025	-14.541	-1.396
	SIZ	-0.310	0.532	-0.223	-0.582	0.582	-1.613	0.993
	TANG	-0.570	0.987	-0.110	-0.578	0.584	-2.986	1.845
	GRO	-0.407	0.369	-0.196	-1.102	0.313	-1.310	0.496
	RISK	3.689	2.026	0.371	1.821	0.118	-1.268	8.646
	NDTS	-0.325	0.501	-0.093	-0.649	0.541	-1.552	0.902
	LIQ	0.359	0.371	0.349	0.965	0.372	-0.550	1.267

Source: Computed from the CMIE Prowess Database.

In this case, the fixed effects estimation is preferred to random effects model. The fixed effects regression equation can be expressed as:

LEV = 3.048 -0.805 (PRO) -0.223 (SIZ) -0.110 (TANG) -0.196 (GRO) +0.371 (RISK) -0.093 (NDTS) +0.349 (LIQ)

EMPIRICAL RESULTS

Regression analysis is used to investigate the relationship between the firm-level variables and leverage. Table-5 shows the correlation coefficient estimates, which tell about the relationship between the independent variables and dependent variable.

Profitability is negatively associated with the leverage, and is consistent with the predictions of pecking-order theory. It shows a negative relationship between profitability and leverage with the coefficient value as -0.805 significant at 5 percent level with P-value as 0.025. It shows that a one unit increase in profitability will reduce the leverage by 0.805.The negative relationship between profitability and leverage accepts the first hypothesis and This finding is also consistent with the same findings by Toy et. al. (1974), Myers (1984), Titman and Wessel (1988), Rajang and Zing Ales (1995), Rajeswara Rao and Sadanandam (1995), Kakani (1999), Booth et. al. (2001), Ozkan (2001), Manos et. al. (2001), Bhaduri, Sumitra (2002), Bhole and Mahakud (2004), Narender and Abhinav Sharma (2006), Santi Gopal Maji and Santanu Kumar Ghosh (2007), Mallikarjunappa and Carmeltia Goveas (2007), Inder Sekhar Yadav et al (2010), Ravinder Vinayek and Anju Gupta (2010), Ali (2011), Amsaveni and Gomathi (2012) and Palvannan and Sekhar (2013). This finding suggests that Automobile firms in India prefer to finance new investments using internal source of financing like retained earnings, surplus etc, prefer to finance new investments.

Firm size has a negatively related to leverage with coefficient value as -0.223 insignificant with P-value as 0.582. It shows that a one unit increase in firm's size will reduce the leverage by 0.223. This negative relationship between both variables accepts the 2nd hypothesis and also consistent with pecking order theory. It is also consistent with the similar finding of the following researchers; Gupta (1969), Bhat, Ramesh (1980), Booth et. al. (2001), Manos et. al. (2001), Bhaduri, Sumitra N (2002), Nrender and Abhinav Sharma (2006), Mallikarjunappa and Carmeltia Goveas (2007), Inder Sekhar Yadav et. al. (2010), Mohan Raj (2011), and Palvannan and Sekhar (2013) . It means that the firms with large size use less leverage in their capital structure.

Tangibility or collateral value of assets is estimated to have negative impact on leverage with coefficient value as -0.110 insignificant with P-value as

0.584. This finding is in line with the findings of previous studies such as Harris and Raviv (1991), Rajeswarao and Sadanandam (1995), Booth et. al. (2001), Manos, Green and Murinde (2001), Bhaduri and Sumitra N (2002), Mallikarjunappa and Carmeltia Goveas (2007) and Ravinder Vinayek and Anju Gupta (2010). It shows that a one unit increase in tangibility of fixed assets will reduce the level of leverage by 0.110. This negative relationship between both variables accept the 3rd hypothesis and also consistent with pecking order theory. It indicates that firms with more tangibility of fixed assets uses more leverage because fixed assets are used for providing collateral for paying back the long term loan safely.

The relationship between leverage and *growth in total assets* is found to be negative, with the coefficient value as -0.196 insignificant level with P-value as 0.313 and is consistent with the predictions of trade-off theory. This shows that a one unit increase in growth will result in decrease in leverage by 0.196. This relationship between both variable is consistent with the following researcher's findings; Bhat, Ramesh (1980), Titman and Wessel (1988), Rajang and Zing Ales (1995), Ozkan (2001) and Mallikarjunappa and Carmeltia Goveas (2007). This result indicates that growing automobile firms in India rely less on debt and more on internal funds (retained earnings) or equity to finance their fresh investment opportunities.

Risk has a positive impact on leverage with coefficient value as 0.371 insignificant level with P-value as 0.118. This positive relationship between both variables rejects the 5th hypothesis. But it supports Agency cost theory. The above relationship is consistent with the similar findings by Toy et. al. (1974), Bhat, Ramesh (1980), Mallikarjunappa and Carmeltia Goveas (2007) and Palvannan and Sekhar (2013).This shows that firms are more likely to use external source of financing rather than internal source, because of the future economic and financial performance of the firms.

The *non-debt tax shields (NDTS)* are negatively related to leverage with coefficient value as -0.093 insignificant with P-value as 0.541. This shows that one unit decrease in non-debt tax shield can cause increase in the level of leverage by 0.093. This accepts the 6th hypothesis and also consistent with pecking order theory which explains the same a negative relationship between both of these variables. This finding is also consistent with the following researchers; Titman and Wessel (1988), Harris and Raviv (1991), Kakani (1999), Bhole and Mahakud (2004), Inder Sekhar Yadav et. al. (2010) and Palvannan and Sekhar (2013). This relationship indicates that firms in Automobile firms with low level tax shield can be deducted from the taxable income tend to use low debt than use internal source of financing.

Liquidity is estimated to have positive impact on leverage with coefficient value as 0.349 insignificant with P-value as 0.372. This shows that one unit decrease in liquidity can cause increase in the level of leverage by 0.349. This rejects the 7th hypothesis and also not consistent with pecking order theory which explains the same a positive relationship between both of these variables. This finding is also consistent with the following researchers; Manos, Green and Murinde (2001), and Narender and Abhinav Sharma (2006). This relationship of liquidity with leverage is somewhat puzzling. It indicates that firms in Automobile sector use more debt than internal source finance, when increasing liquidity also increases the long-term debt ratio.

CONCLUSIONS

The researchers conclude that the Automobile firms of India use pecking order theory for their long term financing decision. Out of 7 variables only one is significant (profitability), and the remaining six factors, such as; size, tangibility, growth, risk, non-debt tax shield and liquidity are insignificant and do not play any role in the determination of leverage in Automobile firms in India.

SUGGESTIONS

The suggestion for the Automobile Companies of India is that they should preferably use internal source of financing to meet their long term investment decision and should use leverage by considering the profitability factor of these firms. This factor plays an important role in the determination of leverage for the firms in Automobile Industry. The results of the present study have delivered some insights into the financing behavior of Indian automobile firms. Nevertheless, this study covers only the determinants of long term debt-to-assets of sample automobile companies. Future, the research may investigate the determinants of short-term debt-to-assets and total debt- to assets.

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