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- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

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- Garg Sambhav (2011): "Business Ethics" Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19–22 June.

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AN EMPIRICAL INVESTIGATION OF THE TRADE-OFF AND PECKING ORDER HYPOTHESES ON INDIAN AUTOMOBILE FIRMS

DR. A. VIJAYAKUMAR
ASSOCIATE PROFESSOR
ERODE ARTS AND SCIENCE COLLEGE
ERODE - 638 009

ABSTRACT

There are two main capital structures theories which emerged from reflections on Modigliani and Miller (1958, 1963) i.e., Trade-off Theory and Pecking Order Theory. According to the trade-off hypothesis profitable firms should have a high level of debt ratio. Contrary to the trade-off hypothesis, the pecking order theory based on information asymmetry predicts a negative correlation between profitability and leverage. This article test the aforementioned hypotheses on a sample of Indian automobile firms from 1996-2009. Using a panel data analysis, the study found that pecking order theory could be successfully applied to the Indian automobile firms.

KEYWORD

Capital Structure, Determinants of capital structure, Pecking Order Theory, Trade-off Theory and Theories of capital structure.

INTRODUCTION

The pioneering paper published in 1958 by **Merton Miller and Franco Modigliani** is considered the cornerstone of modern corporate finance and capital structure analysis. The provocative M&M Theorem provides the conditions under which a firm's financing decisions do not affect its value. It states that, in a perfect capital market, in the absence of taxes, transaction costs, bankruptcy costs and asymmetric information, the value of a firm is unaffected by how that firm is financed. It does not matter if the firm's capital raised by issuing stock or selling debt. It does not matter what the firms' dividend policy is. In a subsequent paper (1963), they eased the initial assumptions and stated that under capital market imperfections (if the financial markets are competitive and corporations are taxed) the value of the levered firm equals that of unlevered firm plus the value of debt tax shield, due to the preferential treatment of debt relative to equity. So the firm's optimal capital structure is determined by the trade-off between the tax advantage associated with debt and the increased bankruptcy risk associated with the higher leverage. This statement predicts that financial leverage and economic performance are in a proportional relationship.

Due to the reflections on MM Theorem, the issue of capital structure has generated unforeseen interest among financial researchers. The results of empirical studies suggested over time that the determination of the optimal capital structure should take into consideration a trade-off between benefits and costs derived from debts. Thus, theories suggest that capital structure affects company's value. Although many empirical studies have been done since the Miller and Modigliani Theorem forms the bases for modern thinking on capital structure, no consensus has been reached with regard to the relationship between profitability and leverage. The three most significant theories that aim to explain the correlation between capital structure and the market value of the firm are the Static Trade-off Theory (STT), Pecking Order Theory (POT) and Market timing models.

STATIC TRADE-OFF THEORY

The essence of the Static Trade-off Theory is that a value maximising firm will consider the trade-off between the tax shelter provided by debt and the cost financial distress. **(Brealey and Myers, 2003).** The earliest version of this theory was elaborated by **Kraus and Litzenberger (1973)** and states that the optimal debt-equity ratio balances the corporate tax advantages of debt against the cost disadvantages of bankruptcy. Firm's adopting this theory could be regarded as setting a target debt-to-value ratio, and would continuously and gradually adjust their capital structures toward this target in order to maximise the firm's value. Hence, if firms seek external financing, they should issue equity when their leverage is above the desired target leverage, issue debt when their leverage is below the target or issue debt and equity proportionately to stay close to the target.

Myers (1984), however, suggests that when the firm's equity is under priced in the market, managers are reluctant to issue equity. The consequence is that potential investors tend to react negatively to an equity issue, because they perceive equity issues to only occur if equity is either fairly priced or overpriced, which conjuncture is not a benefit one to buy the firm's securities. As a result, managers are reluctant to issue equity. In conclusion, according to Static-Trade-off Theory (STT), highly profitable corporations with stable, tangible assets tend to have higher target gearing ratios as their assets are relatively safe. In contrast, companies with mostly intangible and risky assets tend to have lower debt-equity ratio and rely more heavily on equity financing. The trade-off theory fails to explain the simple empirical evidence that more profitable firms have lower leverage, and the use of debt decreases with profitability.

PECKING ORDER THEORY

Although the trade-off theory has dominated corporate finance circles for a long time, interest is also being paid to the pecking order theory. An intriguing approach to studying the optimal capital structure is the so called Pecking Order Theory (POT) **(Donaldson, 1961; Myers & Majluf, 1984; Myers, 1984)** constructed on the information asymmetry hypothesis, which suggests that there is no optimal capital structure. It states that because of asymmetries of information between insiders (managers) and outside lenders and investors, the companies prioritize their sources of financing, and establish a hierarchical order according to the law of least effort or of least resistance. **Myers and Majluf (1984)** assumed that a firm is undervalued because managers have, but cannot reveal, information concerning new and existing investment opportunities. Investors are aware of this asymmetric information problem and they discount the firm's new and existing risky securities when stock issues are announced. On the other side, managers avoid issuing undervalued securities by financing projects with retained earnings and with low-risk debt.

Myers (1984) suggested that the costs of issuing risky debt or equity overwhelm the forces that determine optimal leverage in the trade-off model. The result is the pecking order model, which states that firm finance investments first with retained earnings, then with safe debt, then with risky debt and finally with equity. In conclusion, according to Pecking Order Theory, more profitable firms borrow less, because they have more internal financing available and less profitable firms require external financing, and consequently accumulated debt. However, a number of studies reveal that pecking order theories are not sufficient to explain all capital structure choices **(Fama and French, 2002).**

Thus, POT implies that profitable companies would usually not opt for debt financing for their new projects because of the availability of sizeable amounts of internal funds. However, as per STT, profitable companies would give preference to the use of debt financing in view of the attraction of tax shield benefit available on borrowed funds. Thus, STT predicts that there would be a direct relationship between profitability and leverage, while POT expects the opposite i.e., an inverse relationship between them.

THE MARKET TIMING THEORY

The third theory, the Market Timing Theory (MTT) **(Baker and Wurgler, 2002)** based on the corporate mispricing, provides a new explanation to the financing decisions of the firm and challenges both the Trade-off and the Pecking Order theories. The model suggests that manager's recourse to equity issuance in time periods during which the company's stock have high market values relative to their book and past market values. This lowers the firm's cost of equity and benefits current shareholders at the expense of new shareholders. According to this theory, the equity issuing decisions is guided by the managers' capability to time the market accordingly to the relative cost of debt and equity.

LEVERAGE AND PROFITABILITY – LITERATURE REVIEW

Over the past several decades corporate finance researchers have devoted considerable efforts to transform rationalism of capital structure in to empiricism. The problem of developing a definite theory of capital structure and designing empirical tests those are powerful enough to provide a basis for choosing among the various theories is still unresolved.

The available literature on leverage and profitability depicts a great deal of theoretical controversies. The pecking order theorists **Myers (1984), Myers and Majluf (1984) and Shyamsunder and Myers (1999)** states that firms have a preference of using internal sources of financing first, then debt and finally external equity obtained by stock issues. The preferences are attributed to the cost gap between internal and external funds due to asymmetric information and agency problems. Holding it true profitable firms prefer capitalisation of earnings over debt and new equity issues respectively. This tendency portrays negative association between leverage and profitability of the firm. This association is one of the most systematic findings in the empirical literature. **(Kester, 1986; Harris and Raviv, 1991; Rajan and Zingales, 1995; Kester and Kolb, 1991; Larry et al., 1995; Nikolaos P. Eriotis, 2000; Both et al., 2001; Zhang et al., 2002; Bevan and Danbolt, 2004; Tong and Green, 2005; Fraser et al., 2006; Huang and Song, 2006; Martin Hovey, 2007; Mahdi Salehi, 2009; Gabriela Michalea and Raluca Antal, 2009),** their findings suggest that firms follow a pecking order. Whenever possible firms raise finance preferably from their internal sources, rather than bank loans and debt issue. The external equity financing is there last resort.

A study of South Arabia by **Sulaiman A. Al-Sakran (2001)** where debt do not offer any tax shield, also reported a negative relationship between profitability and leverage. Well known Agency Cost theory **(Jensen and Meckling, 1976)** also tends to support this relationship. **Booth, Aivaizian, Kunt and Maksimovik (2001)** documented that more profitable is firm, the lower the debt ratio regardless of how debt ratio is defined. Using a large sample of firms from 1979 to 1997, **Hovakimian, Opler and Titman (2001)** found that profitable firms have a lower leverage than less profitable firms.

On the other hand in accordance with Trade-off theory in opposite relationship may also be envisaged. Various researchers have analysed different types of trade-offs between capital structure and corporate taxes **(Modigliani and Miller, 1963; Miller, 1977),** personal taxes **(De Angelo and Masulis, 1980),** bankruptcy costs **(Stiglitz, 1972; Titman, 1984),** agency costs **(Jensen and Meckling, 1976; Myers, 1977),** and information asymmetry **(Myers and Majluf, 1984).** The stated rational is when firms are profitable they prefer debt to benefit from the tax shield **[Mseddi and Abid, 2004; Sohail Amjed, 2007 and Mahdi Salehi, 2009).** Other way around profitability is a good proxy for low default risk in consequence profitable firms can borrow more funds at cheaper rates as the likelihood of paying back the debt is greater. Firms use debt financing to dilute their cost of capital due to low Weighted Average Cost of Capital (WACC) firms have wider spans of acceptance for capital budgeting choices. Employment of low cost of capital in productive investment avenues enables firms to magnify their profits. The underlying supposition dictates positive relationship between leverage and profitability.

S. Klien, O'Brien and Peters (2002) argued that firms with lower expected cash flows find it more difficult to incur higher level of debt than do firms with higher level of expected cash flows. Companies with large and stable profits should, all else equal, make greater use of debt to take advantage of interest tax shields **(Anil and Marc Zenner, 2005). Jensen (1986)** reported that profitable firms might signal quality by leveraging up, resulting in a positive relation between leverage and profitability. **Joshua Arbor (2005)** reported significantly positive relationship between short-term debt and profitability and negative association between long-term debt and profitability. This shows that an increase in the long-term debt position is associated with a decrease in profitability.

Further, the empirical study of **Fama and French (2002)** realised on a large panel of firms from 1965 to 1999 reveals support for both theories. **Long and Malitz (1985)** found no relationship between capital structure and profitability. Based on previous literature, it is difficult to make a clear cut prediction of leverage effects on the firms' profitability. Firms may use their debt-to-equity ratio to affect profitability. Some firms choose a high debt-to-equity ratio, whereas others prefer to choose a lower one. The successful selection and use of the debt-to-equity ratio is one of the key elements of the firms' financial strategy. Empirical studies carried out found either a positive or a negative impact of leverage on firms' profitability. Thus, from this theoretical background, the researcher advances the following hypothesis.

H_o-There is positive relationship between leverage and profitability.

Thus, the purpose of the paper is to determine for Indian automobile firms support one of the theories of capital structure. The remainder of the paper is organized as follows. Section II presents the variables of the designed model, the data used in order to test the model and the empirical results. Section III presents the conclusions of this study.

VARIABLES OF THE MODEL

THE DEPENDENT VARIABLE

In the regression, the dependent variable is financial leverage, which is the debt to equity ratio of each firm as measured by the book value of total debt divided by the equity. The main differences among leverage proxies concern the use of book values versus market values and total debt versus only long-term debt. Because of data limitations, the study uses the book values rather than market values. Also, because most of the existing studies focus on a single measure of leverage and the most common measure of debt is total debt, the study defines the Financial Leverage (D_i) as the ratio between the book value of total debt and the book value of equity **(Rajan and Zingales, 1995; De Miguel and Pindado, 2001; Nivorozhkin, 2005)**

EXPLANATORY VARIABLES

The study select the explanatory variables which affect the target leverage of firms based on the assumptions of trade-off and pecking order theories of capital structure and on previous empirical work in this area.

The first explanatory variable is **Tangibility (TANG)** calculated as the ratio between tangible fixed assets and total assets. Tangible assets serve as collateral and the importance of collateral is greater for newly established businesses with no close ties to creditors. Indeed, the results for developed countries **(Rajan and Zingales, 1995; Titman and Wessels, 1988)** confirm this hypothesis. In transitions, economies, the importance of tangible assets as collateral is limited by a number of factors (underdeveloped and inefficient legal systems, illiquid secondary market) and a negative relationship between leverage and tangibility has been found in some previous studies **(Cornelli et al., 1998; Nivorozhkin 2002).** Based on the aforementioned arguments, the study expects to find a negative relationship between leverage and tangibility.

Another determinant of optimal capital structure used in many studies **(Titman & Wessels, 1988; Rajan & Zingales, 1995; Fama and Jensen, 1983; Nivorozhkin, 2005)** is the firm's size. Large firms are more likely to be debt-financed in comparison with smaller firms and that is because of several reasons. One of the reasons is mentioned by **Rajan and Zingales (1995)** who suggested that larger firms tend to be more diversified and thus, less prone to bankruptcy. Another reason is stipulated by the pecking order hypothesis which states that larger firms exhibit lower information asymmetry with financial markets and therefore they are able to issue more equity compared to small companies. The positive relationship between the size of a firm and its leverage may be reinforced in transition economies. The firm size (SIZE) can be measured either through the number of employee or through net sales. Because the net sales are a more appropriate proxy, the study uses the natural logarithm of net sales (Ln sales) and predicts a positive relationship between size and leverage.

The theories of capital structure state that market imperfections lead to the relevance of a firm's profitability (PROF) for its choice of leverage. The pecking order theory predicts that more profitable firms will have a lower debt ratio. In contrast to the pecking order theory, the static trade-off theory predicts a positive

relationship between leverage and profitability because higher profitability implies more income to shield. The study uses the Profit rate on total assets (PR) for firm's profitability and expects to find a negative relationship between leverage and profitability.

Mylers (1977) observed that high growth firms may hold more options for future investments than low growth firms. This statement is congruent with the Pecking order theory, which argues that high growth firms should use less debt for financing. Furthermore, according to the trade-off theory, firms with great growth opportunities (GROW) tend to borrow less than firms holding more tangible assets, because growth opportunities cannot serve as tangible assets. The study defines this proxy as sales growth. However, the firm's profitability positively related to sales growth.

A large non-debt tax shield reduces the expected value of interest tax savings and lessens the advantages of debt financing. **Biger, Nguyen and Hoang (2008)** consider the tax deduction for depreciation and investment tax credits as non-debt tax shield (NDTS). **De Angelo and Masulis (1980)** also suggest that tax deductions for depreciation and investment tax credits substitute the tax deduction of debt financing. The study use the ratio of depreciation to total assets as a proxy for NDTS and expected leverage negatively correlated with NDTS.

In summary, literature review shows that Tangibility, Size, Profitability, Growth and Non-debt tax shield are the determinants of capital structure. The basic regression model used in order to estimate the co-efficients of the determinants of capital structure is as it follows:

$$D_{it} = \beta_0 + \beta_1 \text{Tangibility}_{it} + \beta_2 \text{Size}_{it} + \beta_3 \text{Growth}_{it} + \beta_4 \text{Proftiability}_{it} + \beta_5 \text{Non-debt Tax Shield}_{it} + e_{it}$$

Where,

D_{it} – Measures leverage as the ratio of Total debt to Equity for firm (i) in the year (t)
Tangibility – Measures as the ratio tangible fixed assets and total assets for firm (i) in the year (t)
Size – Natural logarithm of firm's sales for firm (i) in the year (t)
Growth – Growth of firm's sales for firm (i) in the year (t)
Profitability – Measures the firm profitability with gross profit as a percentage of total assets for firm (i) in the year (t)
Non-Debt Tax Shield – The ratio of depreciation to total assets for firm (i) in the year (t)
β_0- Constant term for firm (i) in the year (t).
β_1, β_2….-Regression Co-efficients
e- disturbance term for firm (i) in the year (t).

Table 1 below summarizes the determinants of capital structure, definitions and theoretical predicted signs.

TABLE 1: PROXY VARIABLES DEFINITION AND PREDICTED RELATIONSHIPS

Proxy variables	Definitions	Predicted sign
Tangibility	The ratio of tangible fixed assets and total assets	+
Size	Natural logarithm of firm's sales	+ / -
Growth	Differences between current year sales and previous year sales divided by previous year sales	+ / -
Profitability	Gross Profit as a percentage of total assets	+ / -
Non-Debt Tax Shield	Ratio of Depreciation to total assets	-

HYPOTHESIS

In this part, three capital structure respective hypothesis has been formulated in light of Agency Cost theory, Static Trade-off theory and Pecking order theory. The first hypothesis is formulated for Agency cost theory. Second hypothesis is formulated for Static Trade-off theory. Third Hypothesis is formulated for Pecking Order theory. The hypotheses are tested to find which of those theories are relevant for Indian Automobile firms. Null hypothesis (H_o) is rejected if result is significant at 1 per cent or 5 per cent or 10 per cent, otherwise alternative hypothesis (H_a) is accepted.

Hypothesis 1

H_o – There is negative relationship between leverage and size.
H_a – There is positive relationship between leverage and size.

Hypothesis 2

H2a:

H_o- There is negative relationship between leverage and size.
H_a – There is positive relationship between leverage and size.

H2b:

H_o – There is negative relationship between leverage and the value of tangible assets.
H_a – There is positive relationship between leverage and the value of tangible assets.

H2c:

H_o – There is negative relationship between leverage and non-debt tax shield.
H_a – There is positive relationship between leverage and non-debt tax shield.

Hypothesis 3

H3a:

H_o- There is negative relationship between leverage and growth.
H_a – There is positive relationship between leverage and growth.

H3b:

H_o – There is positive relationship between leverage and profitability.
H_a – There is negative relationship between leverage and profitability.

H3c:

H_o – There is positive relationship between leverage and value of tangible assets.
H_a – There is negative relationship between leverage and value of tangible assets.

SAMPLING DESIGN

Keeping in view the scope of the study, it is decided to include all the companies under automobile industry working before or from the year 1996-97 to 2008-09. There are 26 companies operating in the Indian automobile industry. But, owing to several constraints such as non-availability of financial statements or non-working of a company in a particular year etc., it is compelled to restrict the number of sample companies to 20. The companies under automobile industry are classified into three sectors namely; Commercial vehicles, Passenger cars and Multi-utility vehicles and Two and three wheelers. For the purpose of the study all the three sectors have been selected. It accounts for 73.23 per cent of the total companies available in the Indian automobile industry. The selected 20 companies include 5 under commercial vehicles, 6 under passenger cars and multi-utility vehicles and 9 under two and three wheeler sectors. It is inferred that sample company represents 98.74 percentage of market share in commercial vehicles, 89.76 percentage of market share in passenger cars and Multi-utility vehicles and 99.81 percentage of market share in two and three wheelers. Thus, the findings based on the occurrence of such representative sample may be presumed to be true representative of automobile industry in the country.

The study is mainly based on secondary data. The major source of data analysed and interpreted in this study related to all those companies selected is collected from "PROWESS" database, which is the most reliable on the empowered corporate database of Centre for Monitoring Indian Economy (CMIE). Besides prowess database, relevant secondary data have also been collected from BSE Stock Exchange Official Directory, CMIE Publications, Annual Survey of Industry, Business newspapers, Reports on Currency and Finance, Libraries of various Research Institutions, through Internet etc.

ANALYSIS AND DISCUSSION OF RESULTS

DESCRIPTIVE STATISTICS AND ANALYSIS

The descriptive statistics for the dependent variable and the explanatory variables of the model are presented in Table 2. Descriptive statistics includes the mean, standard deviation, standard error of mean, median, minimum and maximum values, kurtosis and skewness for the period 1996-2009 for 20 Indian automobile firms. The table shows that there are negative values at minimum values i.e., some companies have operated with losses during the period 1996-2009. Table 2 reveals that leverage ranges between 0 to 41.37, with mean of 1.39 and a standard deviation 3.18. As for PR, it ranges between -189.39 to 1638.92, with a mean of 22.29 and a standard deviation of 105.3. The same applies to Tangibility, Growth and Non-Debt Tax shield, which show that the standard deviation is more than the mean. This implies that there is a high variation in the companies mean. The table also reveals that Leverage, Tangibility, PR, Growth and Non-Debt Tax shield have a positive skewness, which indicates that the scores are clustered to the left at the low values. As for Ln sales have a negative skewness indicating clustering of scores are at the high end. As far the Kurtosis statistic, all variables show a positive kurtosis suggesting that the distribution has peaked or clustered in the centre, with long thin tails.

CORRELATION ANALYSIS

A correlation analysis was performed to verify a possible association between and among the variables, in order to test whether there is any linear correlation between and among the variables. Collinearity explains the dependence of one variable to other. When variables are highly correlated they both express essentially the same information. In general, independent variables having collinearity at 0.70 or greater should not include in regression analysis. Table 3 reports the Pearson correlation co-efficients of all the variables employed in the study. Simple correlations among the variables that are reported in Table 3 are quite low. The largest reported value (-0.32) was between Non-Debt Tax shield and Ln sales (size). In this respect, **Kennedy 1985** suggests that correlation values below 0.70 do not pose a potential multicollinearity problem. Hence, colllinearity should not appear problem in our regression analysis.

REGRESSION RESULTS

A multiple regression analysis has been performed to estimate the co-efficients and the direction of relationship between the dependent variable and the independent variables in the specified model in the study. Table 4 shows the stepwise regression results for the model estimated in the study. R-square (co-efficient determination) measures the proportion of the variance jointly explained by the explanatory variables. Adjusted R-square attempts to compensate for this automatic upward shift by imposing a penalty for increasing the number of explanatory variables. The maximum value of R-square is 1. This occurs when the regression line fits the observations exactly. The closer the R-square is to 1, the "better" the overall fit of the estimated regression equation to the actual data. With time series data, R-squared are often in excess of 0.9; with the cross – sectional data, 0.5 might be considered a reasonable good fit **(Baye 2005).**

It can be observed from the table that R-Square explains 85 per cent of the variation in leverage can be captured by independent variables for Indian automobile industry, respectively 87 per cent for Commercial vehicles sector, 94 per cent for Passenger cars and Multiutility vehicles sector and 95 percent for Two and Three wheeler sectors. The rest of leverage's variance is due to factors other than determinants studied in this article. Among the selected automobile firms, R-Square ranges between 68 per cent and 97 per cent for commercial vehicles sector, 55 per cent to 91 per cent for passenger cars and multiutility vehicles sector and 36 per cent to 96 per cent for two and three wheelers sector. F- Statistic provides a measure of the total variations explained by the regression relative to the total unexplained variation. The greater the F – statistic, the better the overall fit of the regression line through the actual data. Regression that has F-statistics with significant values of 10 per cent or less are generally considered significant. In our case F- statistic shows that overall models are significant except Hindustan Motors Ltd under passenger cars and multi-utility vehicles sector and Bajaj Auto Ltd, Kinetic Engineering Ltd and Majestic Auto Limited under two and three wheelers sector.

First, there seems to be a mixed relationship between the share of tangible assets and leverage. Theoretically, firms with large amounts of tangible assets probably already own a stable source of return that pushes them to resort to internal funds rather than debt. Theoretical research predicts positive relationship between tangibility and leverage. The empirical analysis showed that there is a positive relationship between tangibility and leverage in the Indian automobile industry, commercial vehicle sector and passenger cars and Multi-utility vehicles sector. These finding are consistent with those of **Titman and Wessels (1988)** as well as with those of **Ozkan (2000)** who found a positive relationship between the tangibility and leverage. This evidence supports the trade-off hypothesis, which states that tangible assets are used as collateral. However, in case of two and three wheelers sector, this relationship is positive. This finding supports the pecking order prediction which states that the firms with high proportions of tangible assets are more likely to have a lower debt ratio. These findings are consistent with those of **Both et al (2001)** have found a negative relationship between tangibility and leverage. Among the selected firms, 3 out of 5 firms in commercial vehicles sector (Ashok Leyland Ltd, Tata Motors Ltd and Eicher Motors Ltd), 3 out of 6 firms in passenger cars and multi-utility vehicles sector (Mahindra and Mahindra Ltd, Hyundai India Ltd and Honda Siel Ltd), and 5 out of 9 firms in two and three wheeler sector (Bajaj Auto Ltd, Maharashtra Scooters Ltd, TVS Motor company Ltd, Kinetic Engineering Ltd and Majestic Auto Ltd) showed the negative relationship between tangibility and leverage which supports Pecking order hypothesis. In the remaining firms, this relationship is positive which supports the trade-off hypothesis.

Second, the relationship between size and leverage appears to be statistically significant but with a negative sign in the Indian automobile industry, commercial vehicles sector, passenger cars and multi-utility vehicles sector and two and three wheelers sector. This estimate indicates that small manufacturing firms are relatively more indebted compared to larger firms. These findings are inconsistent with those of **Rajan and Zingales (1995) and Booth et al. (2001)** who found a positive relationship between size and leverage. However, among the selected firms, Hindustan Motors Ltd, Hyundai India Ltd and Honda Siel Ltd under passenger cars and multi-utility vehicles sector and LML Ltd, Maharashtra Scooters Ltd and Scooters India Ltd in two and three wheelers sectors, the relationship between the firm size and leverage is positive and statistically significant. One interpretation of this positive relationship is that the banks tend to favour large firms, giving those credits, due to the fact that they seem to be more credible.

As far as profitability is concerned, its relationship with leverage turns out to be negative and statistically significant in Indian automobile industry, commercial vehicles sector, passenger cars and multi-utility vehicles sector and two and three wheelers sector. The negative co-efficient indicates that firms with more profitable projects are prone to use internally generated funds rather than debt. This result is explained by the Pecking order prediction which states that firms prefer internal to external financing and debt to equity. This finding provides evidence supporting "the Pecking order theory" suggested by **Myers and Majluf (1984)** that firms prefer internal funding and turn to external resources as a secondary option. It should be emphasized that **Rajan and Zingales (1995) and Booth et al. (2001)** found similar results respectively for OECD countries and listed companies in developed countries. However, among the selected automobile firms, Swaraj Mazda Ltd under commercial vehicles sector and Maharashtra Scooters Ltd, Hero Honda Motors Ltd and Scooters India Ltd under two and three wheelers sector showed its relationship with leverage turns out to be positive. These findings are consistent with the finding of **Long and Maltiz (1985)** in which they indicate the positive relationship between leverage and the profitability.

Growth potential is another relevant explanatory variable of capital structure choice of Indian automobile industry. The estimates show that the growth potential is positively associated to leverage. The relationship appears to be statistically significant in few cases only. The estimates are in line with the hypothesis according to which firms with promising growth prospects tend to exhaust their internal funds and to resort more intensively to debt.

Finally, the relationship between Non-Debt Tax shield and Leverage appears to be negative in the majority of the selected Indian automobile firms as shown in the regression of Table 4. This finding is also in line with those of **Biger, Nguyen and Hoang (2008) and De Angelo and Masulis (1980).** These studies find that leverage is negatively correlated with Non-Debt Tax Shield. This shows that a large non-debt tax shield reduces the expected value of interest tax savings and lessens the advantage of debt financing.

DISCUSSION OF RESULTS

In this section, an attempt has been made to discuss obtained results in terms of the signs and statistically significance of the co-efficient for independent variables. Table below show obtained and expected signs for five independent variables at Indian automobile firms.

TABLE 5: EXPECTED AND OBSERVED THEORETICAL SIGNS WITH INDEPENDENT VARIABLES

Proxy	Static-Trade off	Pecking order	Observed signs
Tangibility	+	-/+	-/+
Size	+	-	-/+
Profitability	+	-	-/+
Growth	-	+	-/+
Non-Debt Tax Shield	+/-	?	-/+

It is evident from the Table 5 that tangibility is negatively and positively associated with leverage and is consistent with implication of Pecking order theory for Indian automobile firms. Further, size is estimated to have both positive and negative impact on leverage. This is consistent with implications of Pecking order theory and Static Trade-off theory. Similarly profitability variable and growth variable also show both positive and negative impact on leverage, which is consistent with implications of Pecking order theory and Static Trade-off theory. Non-Debt tax shield is also showed both positive and negative impact on leverage, which is consistent with implications of Static Trade-off theory for Indian automobile firms.

CONCLUDING REMARKS

This study examined the trade-off and pecking order hypotheses using a sample of 20 Indian automobile firms. According to trade-off theory, large firms with tangible assets tend to borrow more than small, risky firms with mostly intangible assets and firms with more profitable assets in place, fewer investments, less volatile earnings and net cash-flow have higher leverage. The Pecking order hypothesis predicts a negative correlation between leverage and profitability of the firms. The empirical findings suggest that there is a difference between capital structure choices for companies. The negative relationship between leverage and tangibility might be explained by the lack of long-term debt financing and contradicts the predictions of the trade-off theory. More profitable companies had less debt, because these firms use first of all, internally generated funds and debt as last resort. This result is compatible with the pecking order theory and contradicts the trade-off theory. The relationship between leverage and company size, leverage and profitability and leverage and growth showed both positive and negative impacts, which are compatible with both theories in the sample of Indian automobile firms. To conclude, the Pecking Order theory is more appropriate to explain the capital structure choice of the Indian automobile firms compared to Trade-off theory.

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TABLES

TABLE 2: DESCRIPTIVE STATISTICS OF INDEPENDENT, DEPENDENT AND CONTROL VARIABLES

20 Indian Automobile Firms, 1996 – 2009 – 216 Firm - Year observations (N = 216)							
Variables	**Mean ± S.D**	**Standard Error of mean**	**Median**	**Minimum**	**Maximum**	**kurtosis**	**Skew ness**
Leverage	1.39 ± 3.18	0.20	0.71	0	41.37	106.68	9.18
Tangibility	0.58 ± 1.06	0.07	0.50	0.04	16.95	226.91	14.64
Ln Sales	6.90 ± 1.70	0.11	6.86	0.92	10.39	0.01	-0.27
PR	22.29 ± 105.3	6.62	14.58	-189.39	1638.92	222.83	14.44
Growth	10.60 ± 36.83	2.32	10.13	-97.62	356.66	31.46	3.48
Non – debt Tax shield	0.35 ± 1.38	0.09	0.06	0.01	9.76	27.24	5.22

Notes : Leverage-Total debt to equity ratio; Tangibility- Ratio between tangible fixed assets and total assets ; Ln sales-Natural logarithm of sales (proxy for size); Growth-Sales Growth; PR- Profit rate on total assets ; Non –debt tax shield- Ratio of depreciation total assets

Source: Computed.

TABLE 3: CORRELATION MATRIX

	Leverage	**Tangibility**	**Ln sales**	**PR**	**Growth**	**Non-debt Tax Shield**
Leverage	1.00					
Tangibility	-0.03	1.00				
Ln Sales	-0.09	-0.25	1.00			
PR	-0.03	0.03	0.03	1.00		
Growth	-0.01	0.05	0.05	0.01	1.00	
Non – Debt Tax Shield	-0.06	-0.08	-0.32	-0.03	-0.03	1.00

Notes : Leverage-Total debt to equity ratio; Tangibility- Ratio between tangible fixed assets and total assets ; Ln sales-Natural logarithm of sales (proxy for size); Growth-Sales Growth; PR- Profit rate on total assets ; Non –debt tax shield- Ratio of depreciation total assets

Source: Computed.

TABLE 4: RESULTS OF REGRESSION ANALYSIS – INDIAN AUTOMOBILE FIRMS [LEVERAGE=$\beta_0 + \beta_1$ TANGIBILITY + β_2 SIZE + β_3 PROFITABILITY + β_4 GROWTH + β_5 NON-DEBT TAX SHIELD]

Particulars	Constant	TANGIBILITY	Size	PROFITABILITY	GROWTH	NON-TAX SHIELD	R^2	Adj R^2	F Value	DW
Ashok Leyland Ltd	3.34	-0.72 (3.16)*	-0.24 (2.45)**	-0.01 (3.08)**	0.03 (2.26)**	-6.48 (0.84)	0.91	0.84	13.63*	1.91
Tata Motors Ltd	1.79	- 1.83 (3.14)**	-0.03 (0.85)	-0.03 (6.80)*	0.01 (1.16)	12.11 (2.60)**	0.97	0.96	52.52*	1.82
Bajaj Tempo Ltd	5.38	5.44 (6.30)*	-0.89 (3.07)**	-0.01 (3.63)*	0.01 (1.56)	-9.13 (5.15)*	0.93	0.89	19.59*	1.95
Eicher Motors Ltd	1.39	- 0.22 (0.36)	-0.11 (0.95)	-0.01 (1.36)	0.01 (2.62)**	2.48 (0.38)	0.68	0.59	3.92***	1.39
Swaraj Mazder Ltd	19.65	4.83 (0.16)	-2.36 (3.68)*	0.04 (0.39)	0.03 (2.67)**	-9.74 (0.99)	0.70	0.59	3.48***	1.80
Commercial Vehicle	**3.21**	**0.10 (3.09)****	**-0.18 (2.44)****	**-0.04 (2.12)****	**0.01 (0.22)**	**-3.50 (0.62)**	**0.87**	**0.77**	**9.17***	**1.48**
Hindustan Motors Ltd	-13.32	0.77 (0.21)	2.09 (1.92)***	-0.05 (1.89)***	0.01 (0.54)	16.95 (1.22)	0.55	0.49	1.73	0.85
Mahindra and Mahindra Ltd	5.33	- 7.31 (2.01)***	-0.34 (2.46)**	-0.04 (2.33)**	0.02 (2.02)***	34.78 (1.60)	0.76	0.63	4.32**	1.98
Maruti Udyog Ltd	0.33	0.26 (2.81)**	-0.02 (2.27)***	-0.01 (2.24)***	0.03 (0.78)	-0.49 (0.43)	0.79	0.63	5.11**	1.93
Hyundai India Ltd	0.66	-0.04 (3.24)*	0.09 (3.59)*	-0.02 (3.13)**	0.06 (0.26)	-1.66 (0.44)	0.91	0.85	14.50*	1.37
Honda Siel Ltd	0.02	-0.03 (3.05)**	0.04 (2.73)**	-0.01 (2.40)**	0.03 (0.80)	2.35 (1.19)	0.72	0.65	4.52**	1.77
Ford India Ltd	0.02	2.10 (5.13)*	-0.16 (3.38)*	-0.04 (1.44)	0.03 (0.47)	23.78 (3.09)**	0.94	0.89	20.96*	1.95
Passenger cars and Multi-utility Vehicles	**4.98**	**0.23 (3.21)****	**-0.36 (2.33)****	**-0.03 (1.84)**	**0.01 (1.73)**	**-9.05 (2.47)****	**0.94**	**0.89**	**20.56***	**1.75**
Bajaj Auto Ltd	1.98	-1.85 (0.84)	-0.11 (1.23)	-0.01 (0.13)	0.01 (0.74)	5.71 (0.27)	0.61	0.54	1.41	1.12
LML Ltd	-5.79	0.15 (3.02)**	1.38 (2.77)**	-0.07 (6.35)*	0.01 (0.36)	-3.69 (1.86)	0.88	0.80	10.32*	1.80
Maharastra Scooters Ltd	-0.01	-0.68 (2.90)**	0.03 (6.92)*	0.01 (0.66)	0.08 (2.99)**	0.02 (4.06)*	0.96	0.93	31.30*	1.98
TVS Motor Company Ltd	3.09	-1.17 (2.19)***	-0.22 (1.90)***	-0.03 (4.14)*	0.01 (0.03)	9.83 (2.17)***	0.90	0.82	12.13*	1.60
Kinetic Motor Company Ltd	0.39	1.77 (5.37)*	-1.12 (0.15)	-0.01 (2.11)***	0.01 (3.11)**	-2.81 (1.96)***	0.85	0.80	7.89*	1.98
Hero Honda Motors Ltd	3.12	0.03 (3.07)**	-0.25 (5.36)*	0.03 (2.06)***	0.03 (1.07)	-17.23 (4.26)*	0.96	0.93	30.54*	1.99
Kinetic Engineering Ltd	25.76	-4.83 (0.77)	-1.67 (0.13)	-0.13 (0.37)	-0.09 (0.25)	8.52 (0.34)	0.36	0.25	1.46	1.82
Majestic Auto Ltd	8.15	-5.56 (1.17)	-0.63 (0.56)	-0.07 (2.74)**	-0.01 (0.56)	28.70 (0.90)	0.39	0.31	1.36	1.44
Scooters India Ltd	-0.95	0.07 (3.18)**	0.30 (3.43)*	0.01 (3.42)*	0.01 (0.72)	-0.07 (2.98)**	0.86	0.81	9.31*	1.78
Two & Three Wheelers	**6.38**	**-1.42 (1.06)**	**-0.47 (5.02)***	**-0.02 (1.98)*****	**0.01 (2.93)****	**-16.60 (4.08)***	**0.95**	**0.92**	**27.08***	**1.72**
Whole Industry	**-0.03**	**4.79 (3.54)***	**-0.04 (2.34)****	**-0.02 (3.64)***	**0.01 (0.51)**	**-20.68 (3.30)***	**0.85**	**0.75**	**8.09***	**1.83**

Source: Computed

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