

An Analytical Study on the Determinants of Capital Structure in Indian Automobile, IT and Hotel Sectors



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In finance, capital structure refers to the way a firm finances its investments through equity, debt, or hybrid securities. This study intends to examine the relationship between various factors and its impact on the capital structure of the Indian Automobile, IT and Hotel sector. Data for ten years from automobile, IT and Hotel companies are tested for multicollinearity and then multiple regression models are used to assess the influence of defined explanatory variables on capital structure. The study revealed inconsistency in independent variables influencing the financial leverage though there is a moderate statistical support with respect to Tangibility and Earnings influencing the financial leverage. Finally, these results have been compared to the available evidence.

Keywords: Assets Tangibility, Capital structure, Non-Debt Tax Shield, Business Risk.

1. Introduction

In finance, capital structure or financial leverage refers to the way a firm finances its investment decisions through equity, debt, or hybrid securities. Capital structure or financial leverage is one of the most profuse areas of research in finance. The main issue of argument revolves around the optimal capital structure. There are two schools of thought in this regard. One school claims a close relationship between optimal capital structure and the value of the firm and other argues against it. Financing of the firm's assets is very vital issue in every business. The use of fixed interest bearing debt and fixed dividend bearing preference capital over common equity is termed as use of financial leverage or trade on equity.

The Modigliani-Miller Hypothesis, proposed by Franco Modigliani and Merton Miller (1958), forms the basis for modern thinking on capital structure. They developed a theory that helps firms to understand how taxes and financial distress affect a firm's capital structure decision. They developed the capital-structure irrelevance proposition. According to them in perfect market situations, it does not make any difference whether a firm uses debt or equity in its capital structure to finance its operations. The theory emphasizes the fact that a firm's operating income (earning power) and by the risk of its underlying assets, are the major determinants of its total value. That is the value of the firm is independent of the way it selects to finance its investments.

After The Modigliani-Miller Hypothesis (1958), various theories of capital structure for financing, such as the pecking order theory (Myers (1984) and Myers and Majluf (1984)), the static trade-off theory (Kraus and Litzenberger (1973), and market timing theory (Baker and Wurgler (2002))), emerged. These theories claim that a firm's financing decision does consider taxes, bankruptcy cost, agency costs, growth rate, and other variables. These variables are often referred as "determinants of capital structure". The following are the main competitive theories:

1.1 Pecking Order Theory

Given the pecking order of financing, there is no well-defined target debt-equity ratio, as there are two kinds of equity, internal and external. While the internal equity (retained earnings) is at the top of the pecking order, the external equity is at the bottom. Generally all firms prefer to finance new investment, through internally generated funds on the first occasion, then with borrowed funds, and at the end with an issue of new equity. All firms follow this order because as there are no flotation costs involved in utilization of the internally generated funds and require no disclosure of the firm's proprietary financial information to outsiders. As the managers have privileged information about tangible and intangible assets (growth opportunities), this asymmetry of information affects the firm's financial investment decisions. This is the reason why highly profitable firms generally use little or no debt while financing the new investments. On the other hand, less profitable firms borrow more because their financing need exceed retained earnings and debt finance comes before external equity in the pecking order.

1.2 Agency Costs Theory

M.C. Jensen and Meckling (1976) were the first who proposed Agency Cost Theory. It is assumed under this theory that there exist two types of conflicts of interest in any organization. First conflict is between the managers and shareholders and second is between the shareholders and bondholders. Between shareholders and managers, conflicts arise due to the reason that managers may take decisions in their own self-interests that are not in line with the aim of maximizing shareholders' wealth. Second type of conflict, between the debt-holders and shareholders, arises due to having different approach for risk and

expected return. Debt-holders have more interest in current profit because it guarantees their returns. In contrast, shareholders may be willing to relinquish their current profit in order to get long-term appreciation in capital. This creates an agency problem.

1.3 The Static Trade off theory

The static trade-off theory of capital structure (also referred to as the tax based theory) was introduced by Myers (1984) claims the necessity of establishing a balance between tax saving arising from debt, decrease in agent cost and bankruptcy, financial distress costs. Most managers agree that borrowing saves taxes and that too much borrowing can lead to financial distress. This is very true in case of firms which carry lot of intangible assets.

Value of the firm mainly depends on the profitability and risk exposure of investment proposals (Van Horne 2002). In this study, various determinants of capital structure in Indian context are examined with reference to financial leverage.

1.4 Objectives of the Study

1. To study the impact of various determinants of capital structure (Tangibility (TR), Profitability or Earnings (ER), Growth Rate (GR), Size, Non Debt Tax Shield (NDTS) and Volatility)
2. To explore the relation that exists between the capital structures with various determinants.
3. To identify key drivers of capital structure of Automobile, IT and Hotel sectors for the leverage component.

Research Methodology

The study type is analytical in nature. The research is on the secondary data of 15 companies from each automobile, IT and Hotel sectors listed in BSE. The yearly financial data of the companies from three different sectors namely Automobile, IT and Hotel were collected from annual reports. Following multiple regression model has been used to test the theoretical relationship between the financial leverage and characteristics of the firm.

$$Y = a + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + b_5 X_5 + b_6 X_6, \dots \quad (1)$$

Where,

X_1 = Tangibility (TG)

X_2 = Profitability or Earnings Rate (ER)

X_3 = Growth opportunity (GR)

X_4 = Size

X_5 = Non-debt Tax Shield (NDTS)

X_6 = Business risk (Volatility)

a = constant term of the model

bs = coefficients of the model

Dependent Variable (Y)

It is defined as the ratio of total debt to capital employed, i.e., the total debt (TD). Capital employed includes Net Worth and Total Debt. It is given by $FL = TD / CE \dots \dots \dots$ (2)

Where, FL = Financial Leverage, TD = Total Debt and CE = Capital Employed.

Independent Variable (s) (X_n)

Tangibility (X_1): It is defined as the ratio of fixed assets to the total assets. It is given by $X_1 = TFA / TA \dots \dots \dots$ (4)

Where, TFA = Total Fixed Assets and TA = Total Assets.

Where, EBIT = Earnings before Interest and Tax and TA = Total Assets.

Earnings Rate or Profitability (X_2) It is defined in term of return on total assets. It is given by $X_2 = EBIT / TA \dots \dots \dots$ (3)

Growth Rate (X_3): It is defined as a compound growth rate of total assets. It is given by $X_3 = (TA_n - TA_0) / TA_0 \dots \dots \dots$ (5)

Where, TA_n = total assets at the end of the observed period and TA_0 = Total Assets at the beginning of observed period.

Size of the Firm (X_4): It is defined as the logarithm of total assets of the firms. It is given by $X_4 = \text{Log} (TA) \dots \dots \dots$ (6)

Where, TA = Total Assets.

Non-Debt Tax Shield (X_5): is incentive that firm acquire from tax deduction against depreciation and interest payments other than long term interest loan.

It is given by $X_5 = \text{OI} - \text{I} - \text{T} / 0.33 \dots \dots \dots$ (7)

Where, OI = operating income, I = represents income and T = income tax payments.

Business Risk (X_6): It is defined as the change in closing and opening operating cash flow. It is given by

$$X_6 = \frac{(\text{COCF} - \text{OPCF})}{\text{OPCF}} \dots\dots\dots (8)$$

Where, COCF = Closing Cash Flow and OPCF = Operating Cash Flow.

Hypotheses of the study

This study has tested the following null hypotheses on relation between the defined variables and capital structure of listed companies:

Hypothesis

H0: There is no significant relation between the tangibility, earnings, growth, size, NDTS, business risk and financial leverage.

H1: There is a significant relation between the tangibility, earnings, growth, size, NDTS, business risk and financial leverage.

Plan of Analysis

In the first phase the collected financial data of 45 companies have been used for ascertainment of the Financial Leverage and its six determinants by using the above said formulae from 2004 to 2013. In the second phase all the determinants have been tested for multicollinearity in order to obtain the flawless regression results and in the last phase the regression has been run using excel for the selected five sectors resulting in the coefficients for each determinants. Then those determinants have been tested at 5% level of significance. These coefficients have been used to find the type of relationship that exists between the Financial Leverage using Karl Pearson’s model.

2. Data Analysis And Findings

Automobile Sector

Collinearity is the term used to explain how one variable behaves in relation to another variable.. When two variables are highly correlated they both express basically the same information. Statistically there should not be any multicollinearity because if they exist, then those independent variables are redundant and do not add any predictive value to dependent variable. Therefore Pearson correlation coefficient has been used to establish collinearity among independent variables. The independent variables having collinearity at 0.70 or greater would not be included in regression analysis.

Table 2.1 Inter Correlation Matrix of Independent Variables for Automobile Sector

	TG	ER	GR	Size	NDTS	Volatility
TG	1.0000					
ER	0.25643	1.0000				
GR	0.330706	0.177884	1.0000			
Size	0.185199	0.391445	0.549042	1.0000		
NDTS	0.140036	0.017399	0.205141	0.494152	1.0000	
Volatility	-0.00455	-0.00924	-0.14712	0.016408	0.008104	1.0000

In the Table 2.1 the highest correlation value is 0.549042 between Size and NDTS. Hence, collinearity should not constitute a problem in the regression analysis.

Table 2.2 Regression Results of Automobile Sector

	Coefficients	Standard Error	t Stat	P-value
Intercept	0.466559	0.192741	2.420648	0.016747
TG	-0.67831	0.205316	-3.30374	0.001206
ER	1.612881	0.234761	6.870316	1.82E-10
GR	0.076328	0.207251	0.368289	0.713202
Size	-0.10937	0.078887	-1.38647	0.167762
NDTS	2.41E-05	2.02E-05	1.194219	0.23437
Volatility	-0.00641	0.013452	-0.47628	0.634605

Intercept is α in the set equation. Standard error measures the variability in approximation of the coefficient and lower standard error means coefficient is closer to the true value of the coefficient. Result shows that GR, Size, NDTS and volatility are not statistically significant; However, TG and ER are significant at 1% level of significance.

Table 2.3 Regression Table of Automobile Sector

Regression Statistics	
Multiple R	0.522297
R Square	0.272794
Adjusted R Square	0.242282
Standard Error	0.63774
Observations	150

As the Table 2.3 depicts, there is very little support for the model. R-square value of 27% represents a very low support for the model indicating that only 27% of the information of dependent variable is predicted by the model. However, in all, TG and ER are highly significant. This needs further investigation.

Table 2.4 Inter Correlation Matrix of Independent Variables for IT Sector

	TG	ER	GR	Size	NDTS	Volatility
TG	1.0000					
ER	-0.21574	1.0000				
GR	-0.10759	0.159441	1.0000			
Size	0.230478	-0.22429	-0.81837	1.0000		
NDTS	0.469338	-0.23228	-0.03019	0.350354	1.0000	
Volatility	-0.09978	0.019038	0.017707	-0.01045	0.01307	1.0000

In the Table 2. 4 the highest correlation value is 0.469338 between TG and NDTS indicating that collinearity does not constitute a problem in the regression analysis.

Table 2.5 Regression Results of IT Sector

	Coefficients	Standard Error	t Stat	P-value
Intercept	1.171239	0.214757	5.453795	2.11E-07
TG	-0.90462	0.35226	-2.56806	0.011253
ER	0.125313	0.247087	0.507162	0.612822
GR	-0.12135	0.06618	-1.8337	0.068778
Size	-0.13509	0.055775	-2.42207	0.016684
NDTS	-2.8E-06	7.97E-06	-0.35624	0.722187
Volatility	0.016612	0.003087	5.380463	2.97E-07

Table 2.6 Regression Table of IT Sector

Regression statistics	
Multiple R	0.543011
R square	0.294861
Adjusted R square	0.265274
Standard error	0.505213
Observations	150

Regression results in Table 2.6 reveals that Leverage as measured by the debt ratio is dependent on TG, Size and Volatility and are statistically significant at 5% and 1% level of significance. However, R square of 29.48% does not help much and the model does not capture 70% of the variation in leverage. However the three independent variables are making an impact and needed to be investigated more.

Table 2.7 Inter correlation Matrix of Independent Variables for Hotels Sector

	TG	ER	GR	Size	NDTS	Volatility
TG	1.0000					
ER	-0.44223	1.0000				
GR	0.161613	-0.30161	1.0000			
Size	0.243032	-0.37808	0.117589	1.0000		
NDTS	0.198985	-0.16344	0.071124	0.578253	1.0000	
Volatility	-0.02465	-0.04462	-0.00568	0.042456	0.013829	1.0000

In the Table 2.7 the highest correlation value is 0.578253 between Size and NDTS that means collinearity should not constitute a problem in the regression analysis.

Table 2.8 Regression Results of Hotels Sector

	Coefficients	Standard Error	t Stat	P-value
Intercept	2.71899	0.681297	3.990902	0.000105
TG	-4.05937	0.811517	-5.00221	1.64E-06
ER	-0.71041	0.191469	-3.71033	0.000296
GR	-0.09792	0.42494	-0.23043	0.818083
Size	-0.02409	0.216772	-0.11115	0.911651
NDTS	-4.3E-05	3.86E-05	-1.12644	0.261866
Volatility	0.004734	0.006639	0.713056	0.476973

Table 2.9 Regression Table of Hotels Sector

Regression Statistics	
Multiple R	0.437192
R Square	0.191136
Adjusted R Square	0.157198
Standard Error	1.449198
Observations	150

Result shows that GR, Size, NDTS and Volatility are not statistically significant; However, TG and ER is statistically significant at 1% level of significance. R square value of 19.11% shows that the variation in Financial Leverage is not much dependent on the independent variables, which means there is not much impact of chosen independent variables on the Financial Leverage.

3. Discussion and Conclusions

In the previous chapter the analysis were made based on the results obtained from multiple regression model and Karl Pearson's co-efficient of correlation model. From those results the following findings have been made. In all the chosen three sectors it can be concluded that determinants of capital structure namely; PR, TG, GR, SIZE, NDTS and BR have failed to show statistical significance and the R-square has consistently been of weak support for the model. Though ER, TG, Size and NDTS have been statistically significant in influencing the Financial Leverage of the firm in two sectors, but are not consistent. This needs further investigation on individual independent variables and the model. The study stands to disagree with the earlier research findings that specific independent variables have a great influence on the capital structure of the firm and supports the Pecking Order Theory wherein the internally generated funds are the first choice of managers and then the debt and then the more costly equity. This disagreement could be due to the specific sectors and the time periods chosen. More sectors have to be studied at various ranges of time that could throw more light on the determinants of capital structure in the Indian business environment.

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