

## The Determinants of Capital Structure: An Empirical Study of listed Indian Companies

Anju A Sawlani<sup>1</sup>

Research Scholar

Pacific Academy of Higher Education & Research University  
India

Dr. Rashmi Soni<sup>2</sup>

Associate Professor,

K.J. Somaiya Institute of Management Studies and Research  
India

**Abstract:** Capital structure is the mixture of debt and equity financing. Its choice and determinants are related to different factors. This paper investigates the capital structure determinants of listed firms in India. The determinants of Capital structure of 2439 non-banking and non-finance listed firms in India covering a period of 10 years, 2007 – 2017 are examined. The study adopted a descriptive research design and used correlation and multiple regression model to determine the nature and extent of relationship. With this study, it is intended to contribute to the literature by examining the determinants of corporate capital structure in India.

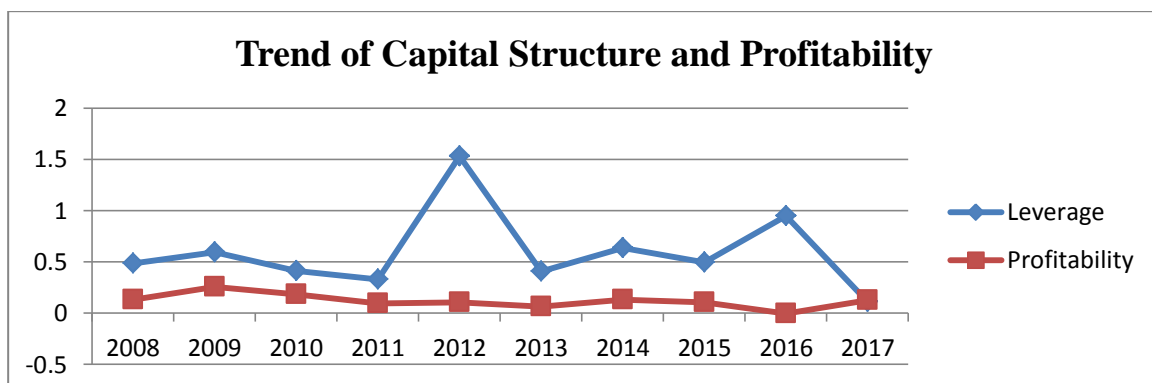
**Keywords:** Capital Structure, Debt Equity, Leverage, Determinants of Capital Structure, Factors affecting capital structure

### I. INTRODUCTION

Capital structure refers to the combination of debt and equity capital which a firm uses to finance its long-term operations. The ratio between debt and equity is named leverage. The pioneers of the research in corporate capital structure are Modigliani & Miller (1958), which published their work almost half a century ago.

After this pioneering work of Modigliani and Miller, capital structure has stimulated intense debate in the financial management arena. Although there are other theories that tried to explain the determinants of capital structure, the number of factors that have the possibility to impact leverage is so large that a single theory is not able to explain the whole capital structure. Moreover, inspite of the continuing theoretical debate on capital structure, there is relatively little empirical evidence on what factors could influence the firm's capital structure in developing countries like India.

This paper aims to provide a more focused perspective on what factors influence the financing decision on listed Indian firms. The research studies 2439 listed Indian companies for the period of 2007 – 2017. The diagram given below illustrates the trend on capital structure and profitability (one of the most important determinant of leverage) of Indian firms over the period of 10 years of study:



## II. LITERATURE REVIEW

The importance of the capital structure issue was formally recognized internationally when the Nobel prize committee awarded its prizes for Economic Sciences to **Franco Modigliani** in 1985 and to **Merton Miller** in 1990, for their work on capital structure. In essence, M&M were able to show that capital structure in a perfect market was irrelevant. The capital structure issue brought up by the M&M propositions had since then created tidal waves in the corporate finance academia. Researchers tested and retested the propositions e.g. Barges (1962).

The summary of the previous research made in the above mentioned area is presented below:

Table 1: Summary of Important Research Works

Sr. no.	Year	Author	Name of the Study	Findings
1.	1945	Chudson	'The Pattern of Corporate Financial Structure: A Cross-Section View of Manufacturing, Mining, Trade, and Construction, 1937'	<ul style="list-style-type: none"> <li>The financial structure of a corporation within an industry is influenced by the size &amp; profitability of the corporation</li> <li>The study confirmed generally held views regarding the association of profitability and corporate financial liquidity</li> <li>The reliance on short-term and long-term debt varies considerably from industry to industry, and the differences are greater for short-term than for long-term debt.</li> </ul>
2.	1952	David Durand	Costs of debt and equity funds for business: trends and problems of measurement	Net Income (NI) & Net Operating Income (NOI) Approach was proposed by author for security valuation. NI approach states that company can increase its value or decrease the cost of capital by using the debt capital. NOI Approach states that the value of a firm and cost of the capital are independent to capital structure.
3.	1956	Modigliani and Miller	The cost of capital, corporation finance and the theory of investment	Correlation between cost of capital and leverage (LEV) was significantly equal to zero. When a corporate income tax under which interest is a deductible expense is considered, gain can accrue to stakeholders from having debt in the CS even when capital markets are perfect.
4.	1963	Solomon	Leverage and the Cost of Capital	Cost of debt does not always remain constant. When the leverage level exceeds the accepted level, the probability of default in interest payments increases thus raising the cost of debt.

**Rajan and Zingales (2002)** in a research on 'A Review of Research on the practices of Corporate finance' found that the extent to which firms are levered is fairly similar across the G-7 countries, with only United Kingdom and Germany being relatively less levered.

**Jitendra Mahakud\* and LM Bhole (2003)** conducted research on 'Determinants of Corporate Capital Structure in India: A Dynamic Panel Data Analysis' studied 330 public limited companies and empirically analyzed various determinants of capital structure using General Method of Moments model. The study identified that size of firm, liquidity and non-debt tax shield are important determinants of capital structure.

**Mitali Sen and J K Pattanayak (2005)** conducted research on a paper titled 'An Empirical Study of the Factors Influencing the Capital Structure of Indian Commercial Banks' by presenting an exploratory factor analytical model to identify bank specific factors, which influence the capital structure of Indian banks.

The sample of 82 banks from public sector, private sector and foreign banks were drawn from the corporate database (Prowess) and the period of study was seven years from 1995-96 to 2001-02. Multiple Regression and Correlation Model was used for the purpose of this study. A set of 16 factors were considered in the study including Cash Balance to Total Assets, NIM, ROA, NPM, etc. and factor analysis was applied on the same.

The study concluded that the six important factors affecting capital structure which are critical in banking sector are liquidity, size, efficiency and growth, quality of assets, profitability and service diversification.

**Amarjit Gill, Nahum Biger and Neil Mathur (2011)** in a research on ‘The Effect of Capital Structure on Profitability: Evidence from the United States’

The paper analyses financial data of 272 US firms for the period of 2005 to 2007. Correlation and Multiple regression was applied by considering profitability as dependent variable and capital structure, size, sales growth and industry as independent variables.

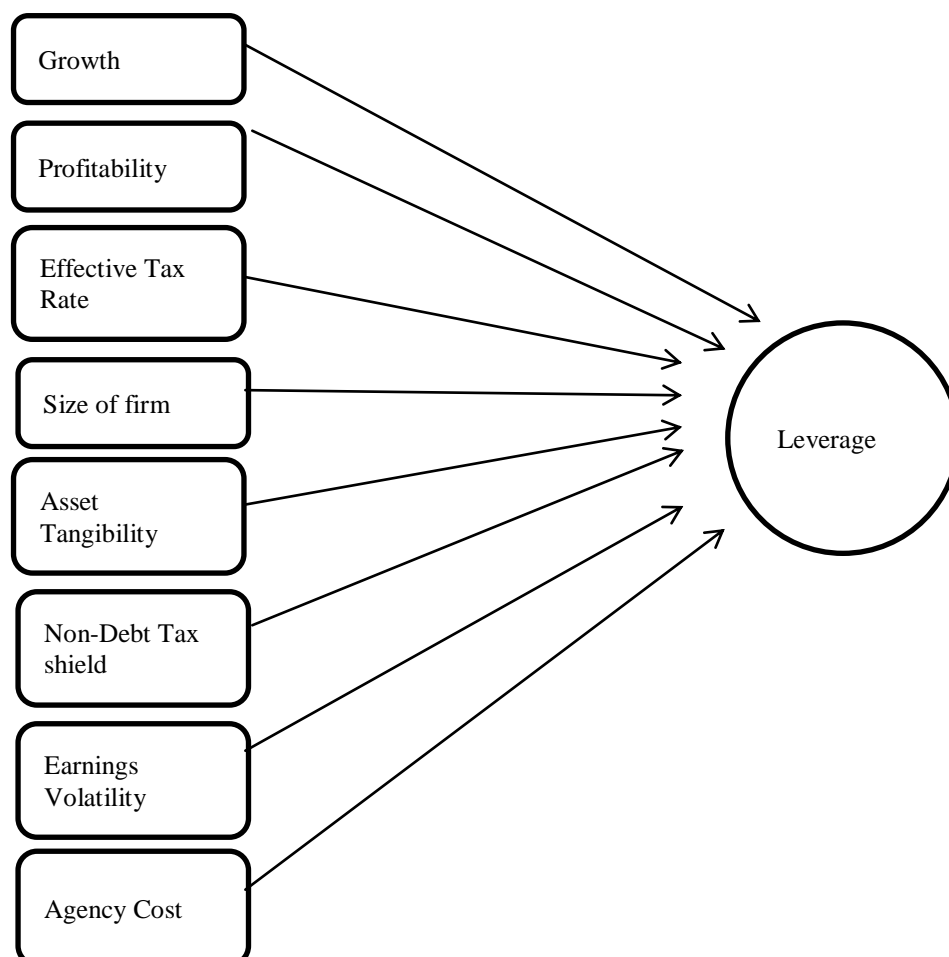
Positive relationships between the ratio of total debt to total assets and profitability were found in both the service and manufacturing industries. This implies that an increase in debt position is associated with an increase in profitability.

### III. RESEARCH METHODOLOGY

#### RESEARCH PROBLEM:

A number of studies have been undertaken nationally and internationally on the topic of capital structure. However, studies have not reached to a consensus as to the effect of capital structure on profitability. The current study is on determinants of leverage in listed Indian Firms for the period of 10 years.

The diagram given below gives the theoretical model of the study:



The model above summarizes the current study on capital structure of a firm. The arrow pointing to the right indicated the expected direction of causality. The model gives the foundation for analysis which is to explain the relation between different variables and capital structure. Variables in the model are selected on the basis of the literature being reviewed.

In this study, leverage is taken as dependent variable and the variables like growth, profitability, effective tax rate, size of firm, asset tangibility, Non-debt tax shield, Earnings volatility and agency cost are independent variables. This empirical test will analyze the impact of the selected variables on capital structure.

### **OBJECTIVES OF RESEARCH:**

This study attempts to fulfill the following objectives:

- To investigate the trend of capital structure being practiced by firms in India.
- To analyze various factors affecting capital structure decisions of firms.

### **DATA COLLECTION AND SAMPLING:**

The data used in this study primarily consist of leverage and its determinants of 2439 listed firms in India. There are 9,546 listed companies in India and eliminating banking and financial companies, we have 7099 listed non-banking and non-finance firms. The financial firms are excluded from this study as they have unique set of financial parameters and different financial structure which can be studied separately. Out of 7,099 firms, the final sample of 2439 firms belonging to 74 different industries has been drawn for the study based on the data refining, thereby eliminating firms with cases of missing information or delayed declaration of financial results.

The data for the period of 10 years from April 2007 to March 2017 are considered for the current study. The data was collected using Capitaline database. The details of the variable measures are as given below:

Variable Code	Name of Variable	Definition	Literature Reference
1.	TD/TA	Leverage as measured by ratio of total debt to total assets	Titman and Wessels (1988) & Rajan and Zingales (1995)
2.	Growth Rate	The average annual growth rate of total assets.	A.Noulas and G. Genimakis (2011)
3.	Profitability	Return on assets as measured by ratio of EBIT to Total Assets	Titman and Wessels (1988)
4.	Effective Tax Rate	Tax provision divide by profit before tax	DeAngelo and Masulis (1980)
5.	Size of Firm	Natural Logarithm of Firm's Sales, lagged one year period	Pandey (2000)
6.	Asset Tangibility	Fixed Asset to Total Asset Ratio is used to measure the value of tangibility	Johnson (1997)
7.	Non-debt tax shield	Ratio of annual depreciation expense to total assets, as proxy for NDTs	Titman and Wessels (1988)
8.	Earnings Volatility	Standard deviation of the percentage change in operating income	Titman and Wessels (1988)
9.	Agency Cost	Efficiency ratios are taken as proxy for agency cost (i) the expense ratio, which is operating expense scaled by annual sales and (ii) the asset utilization ratio, which is annual sales divided by total assets.	Ang, J. S., Cole, R. A., & Lin, J. W. (2000)

**RESEARCH HYPOTHESIS:**

In order to determine the impact of firm specific factors on capital structure, this study tests the following null and alternative hypotheses:

**Hypothesis 1:**

H<sub>0</sub>: There is no significant impact of growth rate on leverage of listed Indian firms.

H<sub>1</sub>: There is significant impact of growth rate on leverage of listed Indian firms.

**Hypothesis 2:**

H<sub>0</sub>: There is no significant impact of profitability on leverage of listed Indian firms.

H<sub>1</sub>: There is significant impact of profitability on leverage of listed Indian firms.

**Hypothesis 3:**

H<sub>0</sub>: There is no significant impact of Effective tax rate on leverage of listed Indian firms.

H<sub>1</sub>: There is significant impact of Effective tax rate on leverage of listed Indian firms.

**Hypothesis 4:**

H<sub>0</sub>: There is no significant impact of Size of Firm on leverage of listed Indian firms.

H<sub>1</sub>: There is significant impact of Size of Firm rate on leverage of listed Indian firms.

**Hypothesis 5:**

H<sub>0</sub>: There is no significant impact of Asset Tangibility on leverage of listed Indian firms.

H<sub>1</sub>: There is significant impact of Asset Tangibility rate on leverage of listed Indian firms.

**Hypothesis 6:**

H<sub>0</sub>: There is no significant impact of Non-debt tax shield on leverage of listed Indian firms.

H<sub>1</sub>: There is significant impact of Non-debt tax shield on leverage of listed Indian firms.

**Hypothesis 7:**

H<sub>0</sub>: There is no significant impact of Earnings Volatility on leverage of listed Indian firms.

H<sub>1</sub>: There is significant impact of Earnings Volatility on leverage of listed Indian firms.

**Hypothesis 8:**

H<sub>0</sub>: There is no significant impact of Agency cost on leverage of listed Indian firms.

H<sub>1</sub>: There is significant impact of Agency cost on leverage of listed Indian firms.

## IV. DATA ANALYSIS AND INTERPRETATION

**DESCRIPTIVE STATISTICS:**

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Leverage	2439	-130.1525	243.2163	.595069	7.2498115
Growth Rate	2439	-245.4205	35147.7247	15.720900	712.4301896
Profitability	2439	-26.5725	18.4026	.119180	1.1163018
Effective Tax Rate	2439	-11.3154	7.1814	.169570	.4627212
Size of Firm	2439	-3.6841	12.7830	4.261468	2.5684349
Assets Tangibility	2439	-26.7054	33.3943	.397092	1.0105681
Non- Debt Tax Shield	2439	-7.7276	3.6361	.036676	.1893930
Earnings Volatility	2439	-24.5722	21.8804	.071356	1.1014205
Agency Cost 1 (Expense Ratio)	2439	-4.1600	56.4881	1.135745	2.1386602
Agency Cost 2 (Asset Utilization Ratio)	2439	-199.9245	308.5424	1.526204	8.3211236
Valid N (listwise)	2439				

The above table shows the descriptive statistics of the variables under study. It is observed that very high variation is found in Leverage and growth rate.

**CORRELATION ANALYSIS:**

Correlations											
		Leverage	Growth Rate	Profitability	Effective Tax Rate	Size of Firm	Assets Tangibility	Non-Debt Tax Shield	Earnings Volatility	Agency Cost 1 (Expense Ratio)	Agency Cost 2 (Asset Utilization Ratio)
Leverage	Pearson Correlation	1	-.002	-.089**	-.043*	-.029	.568**	.159**	.172**	-.007	.072**
	Sig. (2-tailed)		.916	.000	.036	.157	.000	.000	.000	.721	.000
	N	2439	2439	2439	2439	2439	2439	2439	2439	2439	2439
Growth Rate	Pearson Correlation	-.002	1	.000	.000	.032	.002	.002	.000	-.006	-.003
	Sig. (2-tailed)	.916		.999	.990	.112	.920	.904	.983	.769	.880
	N	2439	2439	2439	2439	2439	2439	2439	2439	2439	2439
Profitability	Pearson Correlation	-.089**	.000	1	-.069**	.044*	.086**	.337**	.247**	-.019	.254**
	Sig. (2-tailed)	.000	.999		.001	.031	.000	.000	.000	.347	.000
	N	2439	2439	2439	2439	2439	2439	2439	2439	2439	2439
Effective Tax Rate	Pearson Correlation	-.043*	.000	-.069**	1	.088**	-.069**	-.042*	-.107**	-.039	-.356**
	Sig. (2-tailed)	.036	.990	.001		.000	.001	.040	.000	.054	.000
	N	2439	2439	2439	2439	2439	2439	2439	2439	2439	2439
Size of Firm	Pearson Correlation	-.029	.032	.044*	.088**	1	.031	.013	-.031	-.187**	.065**
	Sig. (2-tailed)	.157	.112	.031	.000		.125	.513	.123	.000	.001

	tailed)										
	N	2439	2439	2439	2439	2439	2439	2439	2439	2439	2439
Assets Tangibility	Pearson Correlation	.568**	.002	.086**	-.069**	.031	1	.694**	.420**	-.005	.375**
	Sig. (2-tailed)	.000	.920	.000	.001	.125		.000	.000	.822	.000
	N	2439	2439	2439	2439	2439	2439	2439	2439	2439	2439
Non- Debt Tax Shield	Pearson Correlation	.159**	.002	.337**	-.042*	.013	.694**	1	.639**	-.002	.494**
	Sig. (2-tailed)	.000	.904	.000	.040	.513	.000		.000	.906	.000
	N	2439	2439	2439	2439	2439	2439	2439	2439	2439	2439
Earnings Volatility	Pearson Correlation	.172**	.000	.247**	-.107**	-.031	.420**	.639**	1	.014	.409**
	Sig. (2-tailed)	.000	.983	.000	.000	.123	.000	.000		.492	.000
	N	2439	2439	2439	2439	2439	2439	2439	2439	2439	2439
Agency Cost 1 (Expense Ratio)	Pearson Correlation	-.007	-.006	-.019	-.039	-.187**	-.005	-.002	.014	1	-.013
	Sig. (2-tailed)	.721	.769	.347	.054	.000	.822	.906	.492		.530
	N	2439	2439	2439	2439	2439	2439	2439	2439	2439	2439
Agency Cost 2 (Asset Utilization Ratio)	Pearson Correlation	.072**	-.003	.254**	-.356**	.065**	.375**	.494**	.409**	-.013	1
	Sig. (2-tailed)	.000	.880	.000	.000	.001	.000	.000	.000	.530	
	N	2439	2439	2439	2439	2439	2439	2439	2439	2439	2439
**. Correlation is significant at the 0.01 level (2-tailed).											
*. Correlation is significant at the 0.05 level (2-tailed).											

The correlation analysis shows that asset tangibility has the highest and significant positive correlation with leverage. It means that firms with more tangible assets have better ability to borrow debt funds. Profitability has significant negative correlation with leverage which indicates that more profitable firms have less leverage in their balance sheet. Growth rate and expense ratio have statistically insignificant correlation numbers. Other variables like effective tax rate, Non-debt tax shield, Earnings volatility and Asset utilization ratio are significantly related to leverage.

## **REGRESSION ANALYSIS:**

### **1. Capital Structure and Growth Rate:**

Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.002 <sup>a</sup>	.000	.000	7.2512821		
a. Predictors: (Constant), Growth_rate						
Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.595	.147		4.054	.000

	Growth_rate	-2.184E-005	.000	-.002	-.106	.916
a. Dependent Variable: Leverage						

The regression equation of Capital structure on leverage is:

$$\text{Capital Structure} = 0.595 + (-2.184E-005) * \text{Growth Rate}$$

Since the P-value is higher than 0.05, the impact of growth rate on leverage is insignificant. Therefore, null hypothesis is accepted.

## 2. Capital Structure and Profitability:

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.089 <sup>a</sup>	.008	.007	7.2228168
a. Predictors: (Constant), Profitability				

Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.664	.147		4.512	.000
	Profitability	-.575	.131	-.089	-4.388	.000
a. Dependent Variable: Leverage						

The regression equation of capital structure on profitability is:

$$\text{Capital Structure} = 0.664 + (-0.575) * \text{Profitability}$$

Since the P-value is less than 0.05, there is a significant impact of profitability on leverage. Therefore, null hypothesis is rejected.

## 3. Capital Structure and Effective Tax Rate:

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.043 <sup>a</sup>	.002	.001	7.2447394
a. Predictors: (Constant), Effective_Tax_Rate				

Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.708	.156		4.532	.000
	Effective_Tax_Rate	-.666	.317	-.043	-2.101	.036
a. Dependent Variable: Leverage						

The regression equation of Capital structure on Effective tax rate:

$$\text{Capital Structure} = 0.708 + (-0.666) * \text{Effective Tax Rate}$$

Since the P-value is less than 0.05, there is a significant impact of effective tax rate on leverage. Therefore, null hypothesis is rejected.



**4. Capital Structure and Size of Firm:**

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.029 <sup>a</sup>	.001	.000	7.2483192
a. Predictors: (Constant), Size_of_Firm				

Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.940	.284		3.305	.001
	Size_of_Firm	-.081	.057	-.029	-1.416	.157
a. Dependent Variable: Leverage						

The regression equation of Capital structure on size of firm:

$$\text{Capital Structure} = 0.940 + (-0.081) * \text{Size of firm}$$

Since the P-value is higher than 0.05, the impact of size of firm on leverage is insignificant. Therefore, null hypothesis is accepted.

**5. Capital Structure and Asset Tangibility:**

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.568 <sup>a</sup>	.323	.323	5.9670789
a. Predictors: (Constant), Assets_Tangibility				

Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.024	.130		-7.884	.000
	Assets_Tangibility	4.076	.120	.568	34.086	.000
a. Dependent Variable: Leverage						

The regression equation of capital structure on asset tangibility is:

$$\text{Capital structure} = -1.024 + 4.076 * \text{Asset Tangibility}$$

Since the P-value is less than 0.05, there is a significant impact of asset tangibility on leverage. Therefore, null hypothesis is rejected.

R-squared value of asset tangibility is 0.323 which means around 32% of the variation in capital structure is explained by asset tangibility. This R-squared value is highest compared to other variables which means asset tangibility and leverage are strongly associated.

**6. Capital Structure and Non-Debt tax shield :**

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.159 <sup>a</sup>	.025	.025	7.1586478
a. Predictors: (Constant), Non_Debt_Tax				

Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.371	.148		2.515	.012
	Non_Debt_Tax	6.100	.766	.159	7.968	.000

a. Dependent Variable: Leverage

The regression equation of Capital structure on Non-Debt tax shield is:

$$\text{Capital Structure} = 0.371 + 6.1 * \text{Non-debt tax shield}$$

Since the P-value is less than 0.05, there is a significant impact of Non-debt tax shield on capital structure. Therefore, null hypothesis is rejected.

It means that that firms having high depreciation in their books use non-debt tax shield rather than leverage to reduce their effective tax rate.

#### 7. Capital Structure and Earnings Volatility:

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.172 <sup>a</sup>	.030	.029	7.1430331

a. Predictors: (Constant), Earning\_Volatility

Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.514	.145		3.548	.000
	Earning_Volatility	1.133	.131	.172	8.628	.000

a. Dependent Variable: Leverage

The regression equation of Capital structure on earnings volatility is:

$$\text{Capital Structure} = 0.514 + 1.133 * \text{Earnings Volatility}$$

Since the P-value is less than 0.05, there is a significant impact of earnings volatility on leverage. Therefore, null hypothesis is rejected.

#### 8. Capital Structure and Agency Cost:

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.007 <sup>a</sup>	.000	.000	7.2511086

a. Predictors: (Constant), Agency\_cost\_1 (Expense Ratio)

Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.623	.166		3.747	.000
	Agency_cost_1 (Expense Ratio)	-.025	.069	-.007	-.358	.721

a. Dependent Variable: Leverage

The regression equation of Capital structure on Expense ratio is:

$$\text{Capital Structure} = 0.623 + (-0.25) * \text{Expense Ratio}$$

Since the P-value is higher than 0.05, the impact of expense ratio on leverage is insignificant. Therefore, null hypothesis is accepted.

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.072 <sup>a</sup>	.005	.005	7.2322479
a. Predictors: (Constant), Agency_cost_2				

Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.499	.149		3.350	.001
	Agency_cost_2	.063	.018	.072	3.586	.000
a. Dependent Variable: Leverage						

The regression equation of Capital structure on asset utilization ratio is:

$$\text{Profitability} = 0.499 + 0.063 * \text{Capital Structure}$$

Since the P-value is less than 0.05, there is a significant impact of asset utilization ratio on leverage. Therefore, null hypothesis is rejected.

Thus the agency cost as measured by asset utilization ratio significantly impacts the leverage.

### **MULTIPLE REGRESSION:**

The variables which have significant relationship with leverage are regressed again to derive the estimation model of leverage. The variables that are not significantly related are excluded from the study. The tables given below show the output of multiple regression:

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.668 <sup>a</sup>	.446	.445	5.4005666
a. Predictors: (Constant), Agency_cost_2, Profitability, Effective_Tax_Rate, Assets_Tangibility, Earning_Volatility, Non_Debt_Tax				

ANOVA <sup>a</sup>						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	57208.707	6	9534.785	326.913	.000 <sup>b</sup>
	Residual	70932.004	2432	29.166		
	Total	128140.711	2438			
a. Dependent Variable: Leverage						
b. Predictors: (Constant), Agency_cost_2, Profitability, Effective_Tax_Rate, Assets_Tangibility, Earning_Volatility, Non_Debt_Tax						
Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	(Constant)	-1.147	.130		-8.842	.000
	Profitability	-.081	.107	-.012	-.751	.453
	Effective_Tax_R	-.176	.257	-.011	-.686	.493

ate						
Assets_Tangibilit	6.378	.155	.889	41.236	.000	
y						
Non_Debt_Tax	-20.046	1.031	-.524	-	.000	
				19.442		
Earning_Volatalit	1.079	.131	.164	8.252	.000	
y						
Agency_cost_2	-.061	.017	-.070	-3.683	.000	
a. Dependent Variable: Leverage						

The regression equation of Capital structure on asset utilization ratio is:

$$\text{Capital Structure} = -1.147 + [(-0.081) * \text{Profitability}] + [(-0.176) * \text{Effective Tax Rate}] + [6.378 * \text{Asset tangibility}] + [(-20.046) * \text{Non-debt tax shield}] + [1.079 * \text{Earnings Volatility}] + [(-0.061 * \text{Asset utilization ratio})]$$

Since the P-value of anova table is less than 0.05, the regression model predicts the capital structure significantly well. R-squared value of 0.446 shows that 44.6% of the variation in leverage is explained by the independent variables like profitability, effective tax rate, asset tangibility, non-debt tax shield, earnings volatility and asset utilization ratio.

The standardized beta co-efficient of asset tangibility is highest which shows that asset tangibility has a higher impact on leverage as compared to other variables.

## V. SUMMERY AND CONCLUSION

The summary of analysis is presented in the table below:

Variables	Relationship	Hypothesis
Capital Structure and Growth Rate	Insignificant Relation	Reject
Capital Structure and Profitability	Significant Negative Relation	Accept
Capital Structure and Effective tax rate	Significant Positive Relation	Accept
Capital Structure and Size of firm	Insignificant Relation	Reject
Capital Structure and Asset tangibility	Significant Positive Relation	Accept
Capital Structure and Non-debt tax shield	Significant Positive Relation	Accept
Capital Structure and Earnings Volatility	Significant Positive Relation	Accept
Capital Structure and Agency Cost (Expense ratio)	Insignificant Relation	Reject
Capital Structure and Agency Cost (Asset utilization ratio)	Significant Positive Relation	Accept

Based on this research done on listed Indian firms, it is found dependence of leverage is highest on asset tangibility. Other variables like profitability, effective tax rate, Non-debt tax shield, Earnings volatility and Asset utilization ratio also have significant impact on leverage. However, variables like growth rate, size of firm and Expense ratio doesn't have significant impact on capital structure in the Indian context. This research works suggests lines of future work which can be done to understand the factors influencing leverage in different countries and draw the fundamental determinants of capital structure.

## References

1. Ang, J. S., Cole, R. A., & Lin, J. W. (2000). Agency costs and ownership structure. *the Journal of Finance*, 55(1), 81-106.
2. Barges (1962), 'The Effect of Capital Structure on the Cost of Capital: A Test and Evaluation of the Modigliani and Miller Propositions', Ph.D. (Finance) Thesis submitted to the Graduate School of North Western University.
3. Brealey, R., Myers, S. C., & Marcus, A. J. (1995). *Fundamentals of Corporate Finance* (p. 69). McGraw-Hill, New York.
4. David Durand (1952), 'Costs of debt and equity funds for business: trends and problems of measurement', Conference on Research in Business Finance, National Bureau of Economic Research, pp.215-262
5. DeAngelo, H., & Masulis, R. W. (1980). Optimal capital structure under corporate and personal taxation. *Journal of financial economics*, 8(1), 3-29.
6. Gill, A., Biger, N., & Mathur, N. (2011). The effect of capital structure on profitability: Evidence from the United States. *International Journal of Management*, 28(4), 3.

7. Johnson, S. A. (1997). An empirical analysis of the determinants of corporate debt ownership structure. *Journal of Financial and Quantitative Analysis*, 32(1), 47-69.
8. Mahakud, J., & Bhole, L. M. (2003). Determinants of corporate capital structure in India: a dynamic panel data analysis. *ICFAI Journal of Applied Finance*, 9(6), 41-51.
9. Modigliani, F., & Miller, M. H. (1958). The cost of capital, corporation finance and the theory of investment. *The American economic review*, 48(3), 261-297.
10. Noulas, A., & Genimakis, G. (2011). The determinants of capital structure choice: evidence from Greek listed companies. *Applied Financial Economics*, 21(6), 379-387.
11. Pandey, I. M., Chotigeat, T., & Ranjit, M. K. (2000). Capital structure choices in an emerging capital market: case of Thailand. *Management and Change*, 4(1), 1-14.
12. Rajan, R. G., & Zingales, L. (1995). What do we know about capital structure? Some evidence from international data. *The journal of Finance*, 50(5), 1421-1460.
13. Richard A. Brealey, Stewart C. Myers, Franklin(2011), 'Principles of Corporate Finance' 10th Edition, McGraw-Hill, Newyork, pp.418
14. Salim, M., & Yadav, R. (2012). Capital structure and firm performance: Evidence from Malaysian listed companies. *Procedia-Social and Behavioral Sciences*, 65, 156-166.
15. Sen, M., & Pattanayak, J. K. (2005). An empirical study of the factors influencing the capital structure of Indian commercial banks. *The ICFAI Journal of Applied Finance*, 9(5), 21-26.
16. Solomon, E. (1963). Leverage and the Cost of Capital. *The Journal of finance*, 18(2), 273-279.
17. Takeh, A., & Navaprabha, J. (2015). Capital structure and its impact on financial performance of Indian steel industry, *International Journal*, 6(6).
18. Titman, S., & Wessels, R. (1988). The determinants of capital structure choice. *The Journal of finance*, 43(1), 1-19.
19. Venugopal, M., & Reddy, M. R (2016). Impact of capital structure on firm's profitability and shareholder wealth maximization: A study of listed Indian cement companies, *IOSR Journal of Business and Management*, 18(4), 21-27.
20. Walter A. Chudson (1945), 'The Pattern of Corporate Financial Structure: A Cross-Section View of Manufacturing, Mining, Trade, and Construction, 1937', National Bureau of Economic Research, pp.1-16.