

Determinants of Capital Structure: Evidence from Indian Pharmaceutical Companies



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The study involves identification of determinants of capital structure of Indian pharmaceutical companies. Data used for the study is the annual financial reports of twenty selected Indian pharmaceuticals companies for the period 2007-17. For the analysis of determinants eight independent variables with a dependent variable have been tested using regression analysis. The results show that the determinants like profitability, growth, asset tangibility, size and cost of debt have no significant impact on capital structure. In contrast, liquidity, tax-rate and debt serving capacity have shown significant impact on capital structure on total debt of the Indian pharmaceutical companies.

Keywords: Capital Structure, Financial Leverage, Debt ratio, Profitability, Cost of Debt.

1. Introduction

Capital structure is the combination of debt and equity used by a company to finance its overall operations and growth. An optimal capital structure is the mix of debt, preferred stock, and common stock that maximizes a company's stock price by minimizing its cost of capital. Determining the optimal capital structure is the most challenging point for the financial managers. Modigliani and Miller (1958) who in their research concluded that the value of the firm is self-determining of capital structure and that the value of an unlevered firm is equal to that of a levered firm. Pharmaceutical companies on the other hand, through research and development, it produces and markets drugs as medicine currently considered as second largest in the Asia. These also hold accountable share generic supplier which is biggest world. Indian pharmaceutical sector supplies over 50 per cent of global demand for various vaccines.

There is a long term debate on determining the ideal capital structure and value of the firms. Many of the researchers have focused on the study to determine the capital structure such as **Zambuto et.al., (2011)** proposed a set of hypotheses that explains the drivers of capital structure decision in this industry tested the validity, results showed that pecking order theory is suitable to explain intra industry differences in capital structure while growth opportunities are the most explicative variable **Masnoon (2012)** founded that growth and tangibility have positive relation while profitability and size have a negative relation with leverage. **Kumar et.al., (2012)** attempted to make an intra company analysis to determine the importance of debt-equity mix for the effective investment policy and included the trend analysis of financial information. **Ramaratnam & Jayaraman (2013)** analyzed about the influence of independent variables such as tangibility ratio, return on total assets, net profit margin and accumulated depreciation to total assets with respect to the dependent variable of leverage ratio. Analysis has revealed the relationship between the independent variable and dependent variable. **Saeed et.al. (2014)** proposed suggestions on how to optimize the enterprise's capital structure. **Chellasamy & Prema (2018)** examined the factors influencing the determinants of Capital Structure of select Pharmaceutical companies; Profitability is the most significant factor which influences the determinants of Capital Structure. **Kavitha & Mohanraj (2019)** analyzed the effect of firm's cost of debt, size, profitability, liquidity and collateral value of asset on capital structure and found that capital structure has negative relation with liquidity and positively related with cost of debt, size of the business, liquidity, profitability and collateral value of asset.

In this paper an attempt is made to examine twenty listed pharmaceutical companies in India and tested a range of hypotheses to determine the factors affecting the capital structure decisions.

Objective of the Study

The present study of determinants of capital structure in selected Indian pharmaceutical companies was to evaluate the following objective

- To identify the determinants of capital structure in Indian Pharmaceutical Companies.

Hypotheses

Based on the available evidence, the following are the hypotheses formulated for the study to understand the impact of each independent variable while raising the total debt for Indian pharma companies (Box 1).

Sl. no	Hypotheses
H ₀₁	There is no significant impact of profitability of Indian companies on total debt
H ₀₂	There is no significant impact of growth of Indian companies on total debt

H₀₃	There is no significant impact of asset tangibility of Indian companies on total debt
H₀₄	There is no significant impact of size of Indian companies on total debt
H₀₅	There is no significant impact of Cost of debt of Indian companies on total debt
H₀₆	There is no significant impact of liquidity of Indian companies on total debt
H₀₇	There is no significant impact of tax rate of Indian companies on total debt
H₀₈	There is no significant impact of debt serving capacity of Indian companies on total debt

Box 1: Null hypothesis formulated for dependent and independent variables.

Data and Sample

Data samples were collected from annual financial statements of 20 selected companies listed in BSE from the period of 2007-2017 from Capitaline Database. Data was selected based on two criteria (a) the constituents of BSE sensex (b) traded for six months in a year during the study period.

Methodology

We have used the methodology of (Handoo & Sharma, 2014) to study the impact of different variables on capital structure. The sample comprises of Indian pharmaceutical companies considering the total debt as dependent variable and eight independent variables (Box 2). Statistical analysis of the collected samples was analyzed using multiple regression analysis and *t*-test by SPSS (statistical package for social sciences).

Sl.no	Variables	Summary
Dependent variable		
1.	Total-debt ratio	Total debt ratio is a financial ratio that indicates the percentage of a company's assets that are provided in comparison to debt. It is the ratio of total debt and total assets calculated by dividing total debt to total assets.
Independent variables		
1.	Profitability	Profitability is the financial benefit that is realized when the amount of revenue gained from a business activity exceeds the expenditure, costs, and taxes needed to sustain the activity. Operating profit rate of return (earnings before interest and taxes (EBIT)/total assets) is used as a measure of profitability.
2.	Growth	Firms with growth options are those that have relatively more capacity expansion projects, new product lines, acquisitions of other firms and maintenance, and replacement of existing assets. The growth factor is measured by the percentage change of assets
3.	Assets tangibility	Asset tangibility refers to all types of tangible assets (e.g. land, building, machines and equipment) that possess some degree of debt capacity. The formula used is the ratio of net fixed assets to total assets.
4.	Size	Large firms are often more diversified and have more stable cash flows; the probability of defaults for large firms is smaller compared to smaller ones. Thus the financial distress risk can be considered lower for larger firms. The measure of a firm's size used in this study is the natural logarithm of its total assets
5.	Cost of debt	Cost of debt is the effective rate that a company pays on its current debt. The measure of cost of debt in the study is using interest before tax/long term debt
6.	Liquidity	Liquidity is the ability to convert an asset to cash immediately. Liquidity was calculated by dividing the total current assets by the total current liabilities
7.	Tax rate	Tax rate is a rate placed depending on the profit of a firm. Tax rate can be measured for each company by dividing its tax provision by profit before tax
8.	Debt serving capacity	It is the ratio between profit before depreciation, interest and taxes to total interest

Box 2: Definition of different variables used in the study.

Regression Model

The relationship between total debt and eight other independent variables was estimated by the following regression equation $Y = \beta_0 + \beta_1(PF) + \beta_2(AT) + \beta_3(GT) + \beta_4(SZ) + \beta_5(CD) + \beta_6(LQ) + \beta_7(TR) + \beta_8(DSC) + e \dots (1)$
Where, Y= Total debt, β_0 =Y intercept, β_1, \dots, β_8 =Slope coefficients, PF= Profitability, AT=Asset tangibility, GT= Growth, SZ= Size, CD=cost of debt, LQ=Liquidity, TR=Tax rate, DSC= Debt serving capacity, e=error

2. Results and Discussion

Regression analysis was used to examine the impact of total debt on variables of financial performance of the listed companies traded in BSE (table 1)

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.910 ^a	.829	.704	.410873349878002	.829	6.656	8	11	.003

a. Predictors: (Constant), Debt serving Capacity, Growth, Assets tangibility, Cost of debt, Liquidity, Tax Rate, Profitability, Size

Table 1: The regression model to measures the impact of determinants of capital structure on total debt bound on profitability, growth, asset-tangibility, size, cost of debt, liquidity, tax rate and debt serving capacity is a good fit with p-value = 0.003 and r = 0.910.

The sign of a regression coefficient tells, whether there is a positive or negative correlation between each independent variable the dependent variable. A positive coefficient indicates that as the value of the independent variable increases, the mean of the dependent variable also tends to increase. The results of the proposed variables are tabulated below

Model	Unstandardized Coefficients		Standardized Coefficients		t	Sig.	Null Hypothesis Results
	β	Std. Error	β				
	(Constant)	-.539	.540		-.999	.339	
	PF	-.462	.906	-.084	-.510	.620	not rejected
	AT	.017	.057	.042	.291	.777	not rejected
	GT	.000	.000	.050	.322	.754	not rejected
	SZ	.295	.183	.302	1.610	.136	not rejected
	CD	-.253	.079	-.438	-3.195	.009	not rejected
	LQ	-.122	.052	-.355	-2.332	.040	rejected
	TR	-.057	.020	-.501	-2.779	.018	rejected
	DSC	.000	.000	-.597	-4.271	.001	rejected

a. Dependent Variable: Log Total debt

Table 2: Coefficients for total debt and other independent variables, where PF-Profitability, AT-Asset-tangibility, GT-Growth, SZ-Size, CD-Cost of debt, LQ-Liquidity, TR-Tax rate, DSC-Debt Serving capacity.

From the table 2, Coefficients of total debt has positive coefficients for assets tangibility, growth size, and debt serving capacity, whereas, profitability, cost of debt, liquidity, tax rate for it is found to be negative.

From the table 2, it was observed that t value for profitability, growth, asset tangibility, size, cost of debt are -0.510, 0.291, 0.322, 1.610, -3.195 respectively, are showing significance at 0.05 level. Hence approving the proposed hypotheses such as H_{01} , H_{02} , H_{03} , H_{04} , and H_{05} for profitability, growth, asset tangibility, size, cost of debt respectively; have no significant impact on total debt of selected Indian pharmaceutical companies. On the other hand, parameters such as liquidity, tax-rate and debt-serving capacity was shown no significance at 0.05 level concluding that these parameters have significance impact on total debt upon rejecting the proposed H_{06} , H_{07} and H_{08} of null hypotheses, respectively.

3. Conclusion

This paper contributes towards understanding the impact of determinants of capital structure in pharmaceutical companies during the period 2007-2017. Hypothesis based on comparing the relationship between total debt and 8 explanatory variables were developed to test the determinants of capital structure of Indian pharmaceutical companies. From the measures it can concluded that for tax rate liquidity, debt serving capacity have significant and positive impact on total debt Further study can be conducted by adding sales growth and business risk as independent variables. To clarify the results of our study more variables for performance measurement may be useful. Data of long time series could also be used for credibility of results. Future research can be processed by comparing the capital structure and firm performance of small and large firms.

4. References

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