Determinants Of Capital Structure: A Study Of The Pharmaceutical Industry In India

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CAPITAL STRUCTURE - INTRODUCTION

Finance is to play a vital role in all organizations and so, it calls for the finance department to be a team player, which is constructively involved in all the operations of the firm. A Firm's Capital structure refers to the mix of liabilities and owners' equity. The main objective of financial management is to minimize cost and maximize the shareholders' wealth. It can be achieved through a proper mix of debt and equity, i.e. capital structure. An optimal capital structure is reached where the overall cost of capital (WACC) is at the minimum. Finance personnel must decide when, where, and how to acquire funds to meet the investment needs of the firm. The central issue before the finance personnel is to determine the proportion of equity and debt with the effects the financial and operating risk factors. A combination of debt and equity is known as the capital structure of the firm. The finance personnel must strive to obtain the best financing combinations, or the optimum capital structure for the firm.

THE INDIAN PHARMACEUTICAL INDUSTRY: AN OVERVIEW

The Indian Pharmaceutical Industry is one of the growing sectors in India's science-based industries. As a highly organized sector, the Indian Pharma Industry is estimated to be worth $ 4.5 billion, growing at about 8 to 9 percent annually. It is the third-largest in the world in terms of volume and rank, and is at the14th rank in terms of value. The Indian Pharmaceutical sector is highly fragmented, with more than 20,000 registered units. It has expanded drastically in the last two decades. The leading 250 pharmaceutical companies control 70% of the market, with the market leader holding nearly 7% of the market share. The pharmaceutical industry in India meets around 70% of the country's demand for bulk drugs, drug intermediates, pharmaceutical formulations, chemicals, tablets, capsules, orals and injectibles. There are about 250 large units and about 8000 Small Scale Units, which form the core of the pharmaceutical industry in India.

❁ **The Present Scenario:** The Indian Pharmaceutical Industry market is expected to reach US$ 55 billion in 2020 from

Table 1: The Top 10 Pharmaceutical Companies In India

Rank	Company	2010 Revenue (₹ in Crores)
1	Cipla	4,198.96
2	Ranbaxy	4,162.25
3	Dr.Reddy's Laboratories	3,763.72
4	Sun Pharmaceutical	2,463.59
5	Lupin Ltd.	2,215.52
6	Aurobindo Pharma	2,081.19
7	GlaxoSmithKline	1,773.41
8	Cadila Healthcare	1,613
9	Aventis Pharma	983.80
10	LPCA Laboratories	980.44

Source: www.pharmaceuticaldrugmanufacturer.com

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US$ 12.6 billion in 2009. The market has further potential to reach US$ 70 billion in 2020. Moreover, the increasing population of the higher-income group in the country opens a potential US$ 8 billion market for multinational companies selling costly drugs by 2015; besides the domestic market is to touch US$ 20 billion in 2015.

❁ **The Top Ten Revenue Makers:** In the domestic market, Cipla retained its leadership position with 5.27 per cent share. Ranbaxy followed suit. The top ten pharmaceutical companies (based on the revenue) during the year 2010 are presented in the Table 1. At present, 100 percent of FDI is allowed for drugs and the pharmaceutical industry. The Government plans to set up US$ 639.56 million venture capital fund to make development for this industry. Hence, the present study focuses on identifying the major determinants of capital structure in the Indian pharmaceutical industry.

STATEMENT OF THE PROBLEM

The foremost objective of a business firm is to achieve maximum profit. However, today's business aims for value addition towards equity shareholders. If a profit of a firm increases, then the value of shareholders also increases. To achieve its objectives, a firm should take proper financial decisions - which can be done through a proper mix of debt-equity choice of capital. The Pharmacy industry in India is playing a vital role in the healthcare area of the nation. With the implementation of product patents from the year 2005, there will be a tough competition for the global market share. The Pharmacy companies will have to focus more intensively on R&D activities to survive the competition. As we are moving towards globalization, there is a need for strategic planning to meet the challenges posed by the product patent era. In the present context, with the available expertise, manpower and skill, the Indian Pharmaceutical Industry will fight successfully for the global market share. Hence, the present study concentrates on the determinants of capital structure in the Indian pharmaceutical industry.

OBJECTIVES OF THE STUDY

1. To examine the factors influencing the debt-equity mix of the pharmaceutical industry.

2. To analyze the impact of leverage in capital structure decisions.

3. To examine the applicability of trade-off and pecking order theories for the Indian Pharmaceutical companies.

RESEARCH METHODOLOGY

Methodology is the science of dealing with principles of procedure in research and study. It deals with the definition of the research problem, research design, method of data collection, sampling design, statistical tools employed and interpretation of survey data.

❁ **Research Design And Period Of The Study:** The design of the present study is descriptive and analytical in nature and covers the period of 11 years, from 2000 to 2010.

❁ **Sources Of Data :** In the present study, secondary data were used. The data was collected from Capitaline and Prowess Database.

❁ **Sample Selection Criteria:** The sample selection was made based on the following criteria:

1. The Pharmaceutical companies listed on the Bombay Stock Exchange Limited during the study period.

2. The Pharmaceutical companies having a positive net-worth during the study period.

3. The Pharmaceutical companies which had not incurred losses during the study period.

4. The Pharmaceutical companies having continuous availability of data.

❁ **Sample Selection:** In India, there are 661 companies in the pharmaceutical industry, 561 companies are public limited; 78 companies are listed on the NSE, and 210 companies are listed on the BSE. Among the 210 pharmaceutical companies listed on the BSE, the sample companies were reduced to 42 companies based on the above-mentioned sample criteria.

❁ **Tools And Techniques:** The variables considered for the analysis include financial leverage, growth, size, profitability, tangibility, uniqueness, Business risk, and Non- debt tax shield. The financial tools like ratio analysis and leverage were used. The statistical tools such as Descriptive, Correlation, Regression, CAGR, and Factor Analysis were applied for the analysis.

❁Scope Of The Study : The finance managers have to plan for borrowings and for additional shares' issue. It is essential to judge the time when the additional funds from the outside sources will be needed and for how long it will be needed. The finance manager should identify the best source of raising funds and the best repayment source. Hence, the financing decisions are helpful in planning for a balanced capital structure. Risk, return and control are the crucial factors relevant in formulating financing decisions. Hence, the present study is focused on the determinants of the capital structure in the Indian pharmaceutical industry. The study focuses on analyzing the factors influencing capital structure decisions, and the impact of leverage on capital structure.

❁Limitations Of The Study : The study was mainly based on secondary data and it was confined only to the Indian pharmaceutical industry. Because of lack of suitable and continuous data for 10 years, the sample size was limited to 42 companies.

HYPOTHESES OF THE STUDY

1. The firm size and tangibility have a positive relationship with leverage.

2. The growth of a firm, liquidity, profitability, Non-Debt tax shield, Business risk, and Uniqueness have a negative relationship with leverage.

CONCEPTUAL FRAME WORK

❁Variables And Their Definitions : The study examines the determinants of capital structure of the Indian pharmaceutical industry. For examining the various factors that affect the capital structure of the companies in India, the present study considers *Leverage as a dependent variable and the following eight factors have been taken as independent variables in the present study.*

1. Profitability (Prof) : The Pecking order theory states that firms prefer internal funds over external funds, suggesting that profitable companies should use more internal funds. This clearly establishes the negative relation between leverage and profitability. Profitability is found to be negatively correlated with leverage. A significant negative relationship between profitability and debt ratio supports the pecking order hypothesis - that firms with liquid assets, and internal accruals would use less debt. In this study, ROA (Return on Assets) is used as a proxy for profitability.

Profitability = EBIT / Total Asset.

2. Firm Size (Size) : The Firm size has been one of the most common variables used in explaining a company's level of debt. There is considerable evidence that the size of a firm plays an important role in the capital structure decisions. As per the trade off theory, larger firms are expected to have a higher debt capacity and consequently, more leverage. Large firms tend to be more diversified and less prone to bankruptcy. Therefore, a positive relationship is expected between a firm's size and its leverage. Size of the firm is measured either by a natural logarithm of assets or of sales. For this study, natural logarithm of assets is used as a proxy for the firm's size.

3. Tangibility (Tang) : Capital structure theories generally state that tangibility is positively related to leverage. However, the more tangible the firm's assets are, the more these can be used as collateral. Therefore, a high fraction of tangible assets is expected to be associated with high leverage. Furthermore, the value of tangible assets should be higher than intangible assets in case of bankruptcy. In the present study, the ratio of net fixed assets to total assets is used as the measure of the firm's asset structure, and is expected to be positively related to leverage.

4. Non – Debt Tax Shields (NDTS) : Non – debt shields (NDTS) include depreciation and investment tax credits. Researchers argue that non debt tax deductions substitute for tax shield benefits of debt financing and a firm with larger non debt tax shields, *Ceteris paribus*, is expected to use less debt. Further, both pecking order and trade off theories imply that non debt tax shields and leverage are negatively correlated. The present study considers the ratio of depreciation plus amortization to total assets as the proxy for NDTS.

5. Growth Opportunities (Grow) : Much controversy exists in academic literature about the relationship between growth rate and level of leverage. According to the pecking order theory hypothesis, initially, a firm uses internally generated funds which, however, may not be sufficient for a growing type firm. Further, the growing firms will use debt financing, which implies that a growing firm will have a high leverage. Thus, as per the pecking order theory,

growth opportunities should be positively related with the leverage of a firm. The present study measures growth in terms of compounded average annual growth. Rate of sales has been taken as the proxy.

6. Business Risk (Volt) : A. Bhaduri (2002) states that since debt involves a commitment of periodic, highly leveraged firms are prone to financial distress costs. Therefore, firms with volatile incomes are likely to be less leveraged. Thus, higher variability in earnings implies increasing profitability of bankruptcy. Thus, we can expect that firms with higher-income variability have lower leverage. Firms that have high operating risk (volatility in earnings) can lower the volatility of the net profit by reducing the level of debt. The current study uses the standard deviation of profitability (Return On Assets) as an indicator for a firm's risk.

7. Liquidity (LIQ) : Theoretically, firms with greater liquid assets may use their assets to finance their investments. Liquidity ratios have both, a positive and a negative effect on the capital structure decision. Therefore, the net effect is unknown. Companies with high liquidity ratios may have relatively higher debt ratios due to their greater ability to meet short term obligations. This argument suggests a positive relationship between a firm's liquidity and its leverage. On the other hand, firms with more liquid assets may use such assets as sources of finance to fund future investment options, suggesting that a firm's liquidity position would have a negative impact on its leverage ratio. Hence, a firm's liquidity position should have an impact on its leverage ratio. In order to measure the effect of liquidity, the present study uses the ratio of current assets to current liabilities as a proxy for the liquidity of the firm's assets (LIQ).

8. Uniqueness : The firms manufacturing unique products tend to have high liquidation costs and ,therefore, uniqueness is expected to show negative relation with debt under trade-off theory. The most appropriate proxy for studying uniqueness may include research and development expenditure of the companies and selling and distribution costs incurred by them. However, due to the unavailability of data, selling and distribution costs over total sales has been used :

Uniqueness = Selling And Distribution Cost/ Total Sales

REVIEW OF LITERATURE

The empirical studies conducted in India, as well as abroad, are presented to differentiate the capital structure decision policy and to form a theoretical base. In order to find out the gaps in the studies, it is pertinent to review the available literature on the related aspects of the present study.

Bhaduri, Saumitra N. (2002) in the study *"Determinants Of Capital Structure Choice: A Study Of The Indian Corporate Sector"* suggested that the optimal capital structure choice can be influenced by factors such as growth, cash flow, size, and product and industry characteristics. The results also confirm the existence of restructuring costs in attaining an optimal capital structure .

Voulgaris, F. and Asteriou, D. (2004) in their study *"Size and Determinants of Capital Structure In The Greek Manufacturing Sector"* revealed the Capital structure decisions of small and medium-sized enterprises (SMEs) and large-sized enterprises (LSEs). The findings show that profitability is a major determinant of capital structure for both size groups. However, efficient assets management and assets growth were found to be essential for the debt structure of LSEs, as opposed to efficiency of current assets, size, sales growth and high fixed assets, which were found to substantially affect the credibility of SMEs.

Akhtar, Shumi (2005), in their study, *"The Determinants of Capital Structure For Australian Multinational and Domestic Corporations"* considered the significance of the determinants of capital structure on a sample of Australian multinational and domestic corporations from 1992 to 2001. The results show that the level of leverage does not differ significantly between multinational and domestic corporations. It found that, for both types of corporations, growth, profitability and size were significant determinants of leverage. Collateral value of assets was a significant determinant of leverage for domestic corporations. For multinationals, bankruptcy costs and the level of geographical diversification were significant. Finally, they concluded that the determinants of capital structure and leverage varied over the sample period for both multinational and domestic corporations.

Margaritis, Dimitris and Psillaki, Maria (2007) in their paper *"Capital Structure and Firm Efficiency"* investigated the relationship between firm efficiency and leverage. They considered both - the effect of leverage on firm performance as well as the reverse causality relationship by using a sample of 12,240 New Zealand firms. They suggested that the effect of tangibles and profitability on leverage was positive, while intangibles and other assets were negatively related

with the capital structure.

Lopez-Iturriaga, Felix J., Rodriguez-Sanz, and Juan Antonio (2008) in their study *"Capital Structure and Institutional Setting: A De-compositional And International Analysis"* indicated that the legal and institutional setting is more influential in firms' financial decisions. They found that the performance and size of the firm, the assets' tangibility and the growth opportunities have a relevant, but differential effect across the different institutional systems, and they suggested that the legal and institutional system of each country does not only affect the firms' capital structure, but also creates the conditions to explain a differential effect of the common determinants of firms' financial choices.

Hence, the present study was undertaken to fill the gap of other authors' studies, and it mainly focuses on the factors that are influential in determining the capital structure. The study also aimed to find out the relationship between the factors in trade-off and pecking order theory of the Indian pharmaceutical industry.

ANALYSIS AND INTERPRETATION

❁ **Analysis Of Data:** The data were analyzed by using descriptive statistics, correlation matrix. The regression line was fitted, taking financial leverage as a dependent variable and other aforesaid variables were taken as independent variables, and factor analysis was also used.

❁ **Descriptive Statistics:** It gives a numerical and graphical procedure to summarize a collection of data in an understandable manner. In this study, the descriptive statistics of mean, median, standard deviation, minimum and maximum were used.

Table 2: Descriptive Statistics

Variables	Obs.	Mean	Median	S.D	Minimum	Maximum
Leverage	42	0.3369	0.3400	0.17401	0.01	0.61
Growth	42	0.2202	0.1950	0.09769	0.08	0.53
Profitability	42	0.2319	0.2000	0.07626	0.16	0.48
Business Risk	42	0.0658	0.0600	0.02153	0.01	0.11
Size	42	2.2010	2.2500	0.73024	0.88	3.50
Tangibility	42	0.4221	0.4500	0.16333	0.09	0.79
Non-Debt Tax shield	42	0.0355	0.0300	0.01626	0.01	0.09
Liquidity	42	3.3133	2.8600	1.50599	1.30	9.50
Uniqueness	42	0.1636	0.1500	0.07752	0.03	0.47

Table 2 provides a summary of the descriptive statistics of the dependent and independent variables. The mean leverage of companies was 0.3369. This means that more than 34% of the pharmaceutical companies taken as a sample were financed by debts. It implies that a majority (66%) of the pharmaceutical companies were financed by equity. The size, as measured by the natural logarithm of total assets, had a mean value of 2.2010. Tangibility, (i.e. the asset structure - determined by the ratio of net fixed assets to total assets) reported a mean of 0.4221, which indicates that the average fixed assets accounted for 42% of the total assets of the companies taken for the study. Liquidity, as measured by the ratio of current assets over current liabilities, had a mean value of 3.3133. The Profitability (which indicates the ratio of earnings before interest and tax to total assets) had a mean value of 0.2319, indicating ROA of 23.19%. The NDTS as measured by the ratio of depreciation and total assets had a mean value of 0.0355. The mean value of growth indicates that on an average, the growth rate in sales was 22.02% during the 10-year study period. Business risk is measured as the standard deviation of profitability, and this showed a mean value of 0.0658. Uniqueness is measured as the ratio of selling and distribution expenses, and total sales showed a mean value of 0.1636.

CORRELATION MATRIX

It is the mathematical tool that is used to describe the degree to which one variable is linearly related to the other, in other words, it is measuring the degree of association of the two variables.

The Table 3 indicates the correlation matrix between dependent and explanatory variables. The result shows that profitability and uniqueness are negatively correlated with leverage, which is significant at 1% and 5% level. Among

Table 3 : Correlation Matrix

Variables		Leverage	Growth	Profitability	Business risk	Size	Tangibility	NDTS	Liquidity	Uniqueness
Leverage	Pearson Correlation	1	.289	-.644**	-.100	-.056	.168	.085	.042	-.364*
	Sig. (2-tailed)		.064	.000	.527	.726	.286	.591	.791	.018
Growth	Pearson Correlation	.289	1	-.122	.090	.164	.140	.173	-.122	-.301
	Sig. (2-tailed)	.064		.441	.572	.299	.375	.274	.443	.053
Profitability	Pearson Correlation	-.644**	-.122	1	.015	.169	-0.287	-.016	-.280	.190
	Sig. (2-tailed)	.000	.441		.923	.284	.066	.917	.072	.227
Business risk	Pearson Correlation	-.100	.090	.015	1	-.118	.349*	.436**	-.124	.029
	Sig. (2-tailed)	.527	.572	.923		.457	.023	.004	.433	.853
Size	Pearson Correlation	-.056	.164	.169	-.118	1	-.335	-.190	-.079	-.005
	Sig. (2-tailed)	.726	.299	.284	.457		.030	.228	.617	.977
Tangibility	Pearson Correlation	.168	.140	-.287	.349*	-.335*	1	.618**	-.193	-0.097
	Sig. (2-tailed)	.286	.375	.066	.023	.030		.000	.221	.541
NDTS	Pearson Correlation	.085	.173	-.016	.436**	-.190	.618**	1	-.269	.000
	Sig. (2-tailed)	.591	.274	.917	.004	.228	.000		.085	.998
Liquidity	Pearson Correlation	.042	-.122	-.280	-.124	-.079	-.193*	-.269	1	.428**
	Sig. (2-tailed)	.791	.443	.072	.433	.617	.221	.085		.005
Uniqueness	Pearson Correlation	-.364*	-.301	.190	.029	-.005	-.097	.000	.428**	1
	Sig. (2-tailed)	.018	.053	.227	.853	.977	.541	.998	.005	

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

independent variables, the correlation between business risk, Non-Debt tax shield, and tangibility are significant at 1% and 5% level. Correlation between Uniqueness and liquidity are significant at 1% level. This implies that growing and highly liquid companies tend to have higher leverage. It reveals that growth, NDTS, liquidity and tangibility are positively correlated with leverage; and on the other hand, profitability, business risk, size, and uniqueness are negatively correlated with leverage. Further, the Table 3 reveals that profitability is positively correlated with size, uniqueness, and business risk. It implies that large-size firms will earn more profit, and it indicates that the profitability of a concern depends upon the uniqueness of the product. The growth of a concern is positively related with Leverage, Business risk and size, Tangibility and Non-debt tax shields.

Table 4 : Regression Results

Variables	Beta (β)	Std. Error	T	P values	VIF
(Constant)	.752	.179	4.123	.000	
Growth	.241	.236	1.020	.315	1.223
Profitability	-1.352	.313	-4.324*	.000	1.305
Business Risk	-1.056	1.099	-0.962	.343	1.284
Size	.001	.031	.034	.973	1.202
Tangibility	.148	.181	.814	.422	2.106
NDTS	2.024	1.730	1.170	.250	1.901
Liquidity	-.004	.019	-.233	.818	1.854
Uniqueness	-.443	.339	-1.307*	.002	1.581

Table 5 : Anova Results					
Model	**Sum of Squares**	**Df**	**Mean Square**	**F**	**Sig**
Regression	.652	8	.081	4.558	.000
Residual	.590	33	.018		
Total	1.241	41			

F statistic giving p value .000 depicts that regression model is highly significant in this study.

Table 6: Model Summary					
Model	**R**	**R square**	**Adjusted R Square**	**Std. Error of the Estimate**	**Durbin-Watson**
1	.739	.546	.436	.13064	1.867

REGRESSION MODEL SPECIFICATIONS

The present study examines the determinants of capital structure of the Indian pharmaceutical industry by using panel data regression analysis. All eight explanatory variables are included in the regression study. The model is represented as follows :

$$LEV = \beta_0 + \beta_1 GROW_{it} + \beta_2 PROF_{it} + \beta_3 RISK_{it} + \beta_4 SIZE_{it} + \beta_5 TANG_{it} + \beta_6 NDTS_{it} + \beta_7 LIQ_{it} + \beta_8 UNIQ_{it} + \epsilon_{it}$$

Where LEV_{it} is the ratio of total debt to total assets for firm i in period t, $PROF_{it}$ is the ratio of earnings before interest and tax to total assets of firm i in period t, $SIZE_{it}$ is the log of total assets for a firm i in period t, $TANG_{it}$ is the ratio of fixed assets to total assets for a firm i in period t, $GROW_{it}$ is the compound annual growth rate of sales for a firm i in period t, $RISK_{it}$ is the variability in earnings for a firm i in period t, LIQ_{it} is the ratio of current assets to current liabilities for firm i in period t, $NDTS_{it}$ is the ratio of depreciation and total assets for firm i in period t, $UNIQ_{it}$ is a ratio of selling and administrative expenses and total sales for a firm i in period t.

Table 4 indicates the regression result of explanatory variables. It is clear that Profitability has a negative relationship with leverage. The results of this study support the pecking order theory, which suggests that profitable firms prefer internal financing, and Leverage has a negative relationship with Profitability. Further, the results are statistically significant (p-value .000) . Hence, the hypothesis has been accepted, and it can be concluded that Profitability of the Indian pharmaceutical industry, taken as the sample, is negatively correlated with Leverage. The uniqueness is negatively related with Leverage, and is clear that the result is statistically significant (p-value .002), and hence, the hypothesis is accepted, and it can be concluded that the Uniqueness of a firm is supportive of the trade-off theory. The size of the firm is positively related with Leverage. This implies that the larger is the firm size, the more is the level of debt in the capital structure of the company. The results are statistically not significant (p-value, .973) at any levels of significance, thereby rejecting the hypothesis which implies that Size does not affect the determinants of capital structure. It is clear that the Size of the firm supports the trade-off theory. The growth and NDTS of the firm are positively related with Leverage. The results are statistically not significant (p-values are .315 and .250) and hence, the hypothesis is rejected, and it can be concluded that the growth of a firm is supportive of the pecking order theory, and NDTS is not supportive of either of the two theories. It reveals that Tangibility is positively related to Leverage, and it is clear that the value is not statistically significantly (p-values .422) and hence, the hypothesis is rejected and it can be concluded that it is supportive of the trade-off theory. The Business risk and Liquidity of a firm are negatively correlated with Leverage. The results are statistically not significant (p-values are .343 and .818), and hence, the hypothesis is rejected and it can be concluded that it is supportive of the pecking order theory. To check whether the multi-collinearity problem exists in the present study, variance inflating factor (VIF) was calculated for each of the eight explanatory variables and is presented in the last column of the Table 4 . These values range from 1.202 to 2.106, and are much less than the rule of thumb range of 5-10. *Hence, the study is not affected by the problem of multi-collinearity.*

The analysis of variance is presented in the Table 5, which shows the p value as .000 and depicting that the regression model is highly significant in this study.

The Table 6 presents the value of R square, which is equal to .546 and suggests that 54.6% of the variation in the capital

Table 7: Relationship Between Explanatory Variables And Leverage						
Variables	**Definition**	**Expected relationship**		**Actual relationship**	**Beta (β)**	**p values**
		Trade-off theory	**Pecking order theory**			
Growth	Compound average growth of annual sales	**Negative**	**Positive**	**Positive**	.241	(.315)
Profitability	EBIT/Total assets	**Positive**	**Negative**	**Negative**	-1.352	(.000)
Business Risk	S.D of profitability	**Negative**	**Negative**	**Negative**	-1.056	(.343)
Size	Natural logarithm of Total asset	**Positive**	**Negative**	**Positive**	.001	(.973)
Tangibility	Net fixed assets/Total assets	**Positive**	**No specific relation**	**Positive**	.148	(.422)
NDTS	Depreciation/Total asset	**Negative**	**No specific relation**	**Positive**	2.024	(.250)
Liquidity	Current asset/Current liabilities	**Positive**	**Negative**	**Negative**	-.004	(.818)
Uniqueness	Selling & distribution expenses/Total sales	**Negative**	**No specific relation**	**Negative**	-.443	(.002)

structure has been explained by the explanatory variables such as *Profitability, Growth Opportunities, Liquidity, Business Risk, Size, Tangibility, Non-debt Tax Shield And Uniqueness*. For detecting the presence of autocorrelation in the data, Durbin Watson (D-W) statistics were analyzed. D-W statistics shows the serial correlation of residuals (first order) and ranges in value from 0 to 4, with an ideal value of 2 indicating that errors are not correlated, although values from 1.75 to 2.25 may be considered acceptable. In this study, the D-W value was 1.867, which is within the acceptable range, and hence, *it can be considered to be good and indicates no auto-correlation.*

The actual results of the present study, along with the expected ones under trade-off and pecking order theories are summarized in the Table 7. *Tangibility, Size, and Uniqueness* variables exhibit the same signs as expected under the trade-off theory. *Profitability, Growth, and Liquidity* exhibit the same signs as expected under the pecking order theory. *Business risk* exhibits the same sign for both - the trade off and the pecking order theory. *Non-debt tax shield* is not expected to have any specific relation under the two theories. On the whole, the result of the present study indicates an equal chance for both the theories.

STEP-WISE REGRESSION

Step-wise regression analysis has been used to find out the explanatory variables contributing the most towards the variation in the capital structure of the Indian pharmaceutical industry. The most important factors explaining the variation in the capital structure of the Indian pharmaceutical industries are *Profitability and Uniqueness*.

Table 8 : Step-Wise Regression Results					
Model		**Beta (β)**	**Std. Error**	**T value**	**P values**
1	(constant)	.678	.067	10.078	.000
	Profitability	-1.471	.276	-5.331	.000
2	(Constant)	.745	.072	10.373	.000
	Profitability	-1.362	.270	-.5.054	.000
	Uniqueness	-.561	.265	-2.118	.002

The Table 8 shows the step-wise regression results. It reveals that *Profitability and Uniqueness* are negatively correlated with leverage, indicating them as statistically significant (p value is .000 and .002) and ,therefore, the

Table 9 : KMO And Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.581
Bartlett's Test of Sphericity	Approx. Chi-Square	115.477
	Df	36
	Sig.	.000

hypothesis is accepted. Hence, it can be concluded that *Profitability* is supportive of the pecking order theory, and uniqueness is supportive of the trade-off theory.

FACTOR ANALYSIS

The factor analysis is a very useful method for reducing data complexity by reducing the number of variables that are being studied. The KMO measure of sampling adequacy is calculated by using the correlation to test whether the variables in the sample are adequate to correlate. The general rule of the thumb is that the KMO value should be greater than 0.5 for a satisfactory factor analysis to proceed. The results in the Table 9 show the KMO value to be .581, which is more than the thumb rule. The Bartlett's test of sphericity depicts the presence of a relationship between the variables, and was also found to be significant at 1% level. Hence, the result indicates that it makes sense to continue with the factor analysis. Tables 10 and 11 show that the principal component analysis with varimax rotation gives a clear picture of the rotated component matrix of factor loadings as 4 factors. It is observed from the Table 10 that the 4 factors were extracted together for 74.96 % of the total variance (information contained in the original 9 factors). Hence, the factors were reduced from 9 to 4 factors. From the Table 11, it can be seen that the factors *Tangibility and Business risk* have loaded as 0.781 and 0.739 on Factor 1 respectively. Thus, Factor 1 can be interpreted as a combination of *Tangibility And Business risk*. Therefore, this factor can be named as *"Asset structure"*. In Factor 2, it is evident that *Profitability* has loaded as 0.900, therefore, it can be named as *"Profitability"*. In Factor 3, it is noted that *'Growth'* has the highest load of 0.615. Therefore, this can be interpreted as *"Growth"*. In Factor 4, *The Size Of The Firm* loaded as 0.788, and *Growth* loaded as 0.714. Therefore, this factor can be named as *"Length And Width"*, which can be interpreted based on the swing of the assets and sales. Hence, these 4 factors namely - *Tangibility, Profitability,*

Table 10 : Total Variance Explained

Component	Initial Eigen values			Extraction Sums of Squared loadings			Rotations Sums of Squared Loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	2.350	26.112	26.112	2.350	26.112	26.112	2.040	22.666	22.666
2	1.858	20.642	46.754	1.858	20.642	46.754	2.010	22.332	44.999
3	1.490	16.556	63.310	1.490	16.556	63.310	1.481	16.460	61.458
4	1.049	11.654	74.964	1.049	11.654	74.964	1.216	13.506	74.964
5	.685	7.608	82.572						
6	.612	6.801	89.373						
7	.408	4.535	93.908						
8	.332	3.690	97.599						
9	.216	2.401	100.000						

Table 11: Rotated Compound Matrix

Variables	Component			
	1	2	3	4
Tangibility	.781		.130	
NDTS	.651	.290	.131	-.200
Business Risk	.739	-.143	.073	.095
Size	-.425	.343	.359	.788
Profitability		.900		.102
Leverage		-.808	.372	.133
Uniqueness	.085	.210	-.784	-.051
Liquidity	-.318	-.407	-.670	-.052
Growth	.055	-.200	.615	.714

Growth, Length and Width of assets and sales have a high influence in determining the capital structure.

SUMMARY OF FINDINGS

- From this study, it is found that the mean value of leverage was 0.3369. This means that more than 34% of the pharmaceutical companies are financed by debts. The size and liquidity have a high mean value of 2.2010 and 3.3133.
- The result shows that the growth, tangibility, NDTS, and liquidity are positively correlated with leverage; profitability, business risk, size, and uniqueness are negatively correlated with leverage.
- The regression results of explanatory variables make it clear that *Growth* has a positive relationship and *Profitability, Liquidity* have a negative relationship with *Leverage*. Hence, the results are supportive of the pecking order theory. The *Size And Tangibility* are positively related and *Uniqueness* is negatively related with *Leverage* and it is supportive of the trade-off theory. The business risk exhibits a negative sign and it is supportive of the two theories. *Non-debt Tax Shield* is positively related with *Leverage*, but it is not supportive of either of the two theories.
- The step-wise regression results show that *Profitability and Uniqueness* have a more significant relation with *Leverage.*
- The factor analysis reveals that the 9 factors were reduced to 4 factors showing 74.96 % of the total variance. The major 4 factors were *'Tangibility', 'Profitability', 'Growth' and 'Length and width of assets and sales',* which had a high influence in determining the capital structure.

SUGGESTIONS

- An optimal capital structure depends upon the proper mix of debt and equity. The trade off theory suggests that a more profitable company can prefer external sources for increasing their capital, which reduces the tax liability. As per the present study, most of the companies were using equity finance. Hence, it is suggested that the firms can raise their funds through external sources also.
- Growth of the firm is positively related to the pecking order theory. Hence, the suggestions from this theory (for raising the funds) are recommended to have a long term benefit.
- Firms should not completely depend on 100% equity and 100% debt. It should have a proper mix based on its environmental factors like regulatory framework, profitability, risk condition, etc.,

CONCLUSION

The study analyzed the determinants of capital structure by taking 42 Indian pharmaceutical companies listed in the BSE for the period from 2000 to 2010. *Profitability and Uniqueness* have a high influence towards the *Leverage*. *Growth* has a positive relationship and *Profitability, Liquidity* have a negative relationship with *Leverage*, and it is supportive of the pecking order theory. The *Size and Tangibility* are positively related, and *Uniqueness* is negatively related with *Leverage*, and it is supportive of the trade-off theory. *The results thus confirm the usefulness of taking the Asset Structure, Growth, Business Risk, Profitability, And Uniqueness as the determinants of capital structure*. The Indian Pharmaceutical Companies have a wide scope, and they could opt for more debt funds and enjoy the benefits of high gearing and thereby, increase their shareholders' value.

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