

## CAPITAL STRUCTURE BEHAVIOR WITH SIZE OF BUSINESS– A CASE OF INDIAN PHARMACEUTICAL INDUSTRY

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### **Abstract**

Financing decision by Indian corporate has been found as critical area for research in last two decade. The finance manager has to take decision regarding investment and financing for further growth by creating shareholder's wealth. Finance manager find himself in dilemma while using sources of finance i.e. equity or debt or what proportion of debt and equity should be used. Theoretical concept of optimum capital structure becomes difficult in practical use and controversial, any proportion of debt and equity which destroys shareholder wealth should be avoided. Earlier research in this area is not itself clear to support the theory and also failed to put an end to find out a uniform set of determinants of capital structure of a firm. Literature review shows regression model which found fit for one company is found not fit to use for its industry and also a model which found fit for one industry found not fit in using for other industry. In this paper attempt has been made to explore relation of capital structure behavior with the size of the business. This study has conducted on 88 BSE listed companies for a period of 2006 to 2011. As the business expands its asset structure, profitability, solvency, liquidity varies with changing size of business and its financing strategy too. So these 88 companies are reclassified in 7 categories on the basis of their size for further study. The study finds out that determinants of capital structure is different in all seven categories and hence proved that capital structure determinants differs on the basis of size of the business in Indian pharmaceutical companies.

**Keywords: - equity, financial leverage, size of business, pecking order theory,**

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## 1) Introduction

Stewart C. Myres in his article capital structure puzzle asked “How do firms choose their capital structure”? The answer is “We don’t know”. Capital structure is extremely debated subject in the area of finance from last sixty years. The question is the way in which finance manager use wisely the proportion of debt and equity. Financing mix also impose some obligations on manager which need to be fulfilled for value of firm. Debt imposes interest burden on the firm and equity shareholders seek for growth in dividend. As firm increase in terms of its size, its working capital, investment also increases. It is very important to understand on which factors these growing companies decide capital structure decisions. For good managed growing company retained earnings is cheapest way to finance their future operations with debt and equity. As debt helps to increase shareholders wealth but beyond certain point cost of financial distress and cost of agency offset every increase by tax advantage. The business risk affects financing mix of the firm. The degree of business risk depends up on various factors like competitiveness of the firm, portfolio and quality of the product, operating efficiency of the business, variation in demand. The firm faces different problems and opportunities in every stage of its size (in terms of its revenue). With its growing size it experiences and learn to meet the challenges by taking risk, motivating its people. But at every stage of its size, it faces different opportunities and challenges. At every stage, it has different capital structure to financing its operations. So in this paper attempt has been made to evaluate capital structure decisions of finance manager on the basis of varying firm size. For this study a case of Indian pharmaceutical companies has considered.

First section of this paper introduces with subject of paper, second section include literature review, third section shows research methodology adopted for this research, fourth section shows findings of the study and final fifth section of this paper conclude this paper.

## 2) Review of literature

### 2.1) Review of capital structure theories

David Durand (1952) has provided extreme view on capital structure in net income approach (NI) and net operating income approach (NOI), while former argues that capital structure and market value of firm is dependent on debt and later argues that capital structure and market value of firm is independent on debt. The history of research in capital structure has started after Modigliani & Miller (1958), he argues that investor does not discriminate between levered and

unlevered firm and investors follows arbitrage opportunities. Under perfect capital market debt equity decisions does not affect cost of capital and market value of firm. He argues it is not liability side (i.e. debt and equity) that decide the market value of firm but the asset side which decide the earnings and then market value of firm. Myers (1984) have propounded pecking order theory and found inverse relationship with the profitability and liquidity. He suggested that firm's first use retained earnings then debt capital and in last equity to meet its financing needs. Michael C. Jensen (1986) explained that manager's are interested in increasing resources under their control and invest free cash flow in low return projects. He proposed the benefits of debt finance in reducing agency cost of free cash flow.

Empirical evidence is mixed on corporate self selected decisions like debt issuance are push events (internal) or pull event (external) and manager take decisions to increase value or reduce risk (Subhankar Nayak 2011). Azhagaiah Ramchandran (2010) has studied dividend behavior in Indian companies on the basis of firm size. When he studied all sample firms found that capital structure influence the dividend payout in all sectors.

## **2.2) Review of determinants of capital structure in Indian pharmaceutical companies**

Dr. R. Amsaveni (2012) has studied factors influencing debt equity mix in 42 BSE listed Indian pharmaceutical companies having positive net worth. He found in his study 0.33 mean leverage in these companies during 2000-2010 and it indicates 34% debt is used to finance the assets. Also his results shows growth opportunities, tangibility, non debt tax shield and liquidity are positively related with the leverage and profitability, business risk, size and uniqueness are negatively related with the leverage. Franklin et al. (2011) has studied top 25 Indian pharmaceutical companies from 1998 to 2009 and found that interest, cash flow, asset structure, interest coverage significant determinants of capital structure. During the period he found out that the Indian pharmaceutical companies employ significant debt in their capital structure and it impact on increased value of a firm. Franklin et al. (2011) in his another study from 1978 to 2009, classified Indian pharmaceutical companies on the basis of size small, medium and large size and examined whether financing choice affects firms investment decisions. He found that leverage positively affects investment decisions in small firms and no impact in medium and large size firms. T.Mallikarjunappa (2007) has studied 71 listed Indian pharmaceutical companies from 1993 to 2009 and found debt service capacity, non debt tax shield, liquidity and business risk are significant determinants of capital structure. G.Shanmugasundaram (2008)

explained the variations in the capital structure between process potent period (1988-89 to 1993-94) and transition period (1994-95 to 2003-04) and studied 6 Indian and 4 MNC's which contribute to 30% of market share. He found that there is structural change in the leverage after change of policy favoring product patent over process potent. M.A. Suresh Kumar (2012) has studied 17 pharmaceutical companies for 5 year period i.e. 2004 to 2008 and found out that agency cost of equity, operating leverage, tangibility and debt service capacity are significant determinants of capital structure. He also found out that determinants of capital structure in developed country and in India are same.

### 3) Research Methodology

#### 3.1) Data collection :-

This study is based on secondary data of BSE listed pharmaceutical companies and the data required is financial statement of these companies and the same is collected from PROWESS database.

#### 3.2) Sample size

At the initial stage of the research, study has conducted on 120 BSE listed companies but due to non availability of data and other factors 32 companies has excluded from the sample size. Then remaining 88 companies are included in final sample for the study. Whole sample includes 88 BSE listed companies are again classified in 7 different categories on the basis of their size and size of business is measured in terms of revenue of the business.

**Table No. 01- Classification of sample companies on the basis of size of business**

Sr. No.	Size of Business (Rs. Millions)	Sample companies
1	100-500	26
2	501-100	6
3	1000-1500	7
4	1501-2000	8
5	2001-2500	3
6	2501-3000	8
7	3001 and above	30
<b>Total Sample Size</b>		<b>88</b>

#### 3.3) Hypothesis

This study has tested the following null hypotheses:-

**H<sub>0</sub>**:- There is no significant relation between financial leverage and size of business, profitability, tangibility, non debt tax shield, growth in asset, interest coverage ratio , liquidity.

### 3.4) Specification of the model:-

Following multiple regression model has used to test the theoretical relation between the financial leverage and characteristics of the firm.

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7$$

#### Where

Y = Financial Leverage (FL) ,X<sub>1</sub>:- Size of firm (SZ) ,X<sub>2</sub>:- Profitability (PRFT) ,X<sub>3</sub>:- Tangibility (TG) , X<sub>4</sub> :- Non Debt Tax shield (NDTS), X<sub>5</sub> :- Growth in Asset (GRWTH) ,X<sub>6</sub> :- Liquidity (LIQ), X<sub>7</sub>:- Interest Coverage Ratio (ICR)

### 3.5) Variables used in the study

- 1) **Financial Leverage**:- Researchers generally measure financial leverage as **total debt to equity**. But Rajan and Zingales (1995) stated that financial leverage is measured as per objectives of study. This study uses definition of leverage suggested by Rajan and Zingales , Mahabuba Lima as **Total Debt to Total Asset**.
- 2) **Size of business**:- Size of business is measured in terms of sales or total asset. G. Shanmugasundaram (2008) defined size in terms of asset. Keshar J. Baral (2004) , Mary Dawood (2011) defined as size of the business is measured as natural log of sales. In this paper size of business has defined as **natural log of sales**.
- 3) **Profitability**:- The term profitability is measure in two terms 1) ROI 2) Margin of Sales. Return on investment is measured as EBIT to total asset and Margin on sales operating income to net sales. In this study profitability is measured as in terms of **Return on investment**.
- 4) **Tangibility**:- Mahabuba Lima, Keshar j. Baral (2004), G. Shanmugasundaram (2008) , Mehadi Ebadi (2011), Rajan and Zingales (1995) defined tangibility as a ratio of fixed asset to total asset. Hence this study has followed the same method followed by earlier researcher. Tangibility is measured as **fixed asset to total asset**.
- 5) **Non Debt Tax Shield** :- Non debt tax shield is measured as **depreciation to total asset**. The corporate tax shields like depreciation reduce debt Deangelo (1980) and non debt tax shield may have negative association with the depreciation.

- 6) **Growth in asset:** - Growth in asset has defined as **Incremental Total Assets** (i.e. Current Year TA minus Previous Year TA) to previous Year's TA. This measure has been used by Mahabuba Lima, T. Mallikarjunappa (2007) , Titman and Wessels (1988), Mary Dawood (2011).
- 7) **Interest Coverage Ratio :-** Interest coverage ratio has defined as **EBIT to interest** and the same has been measured by earlier researchers Mahabuba Lima, Franklin John (2011), T. Mallikarjunappa (2007), M.A. Suresh Kumar (2012).
- 8) **Liquidity:** - Firms with more liquid assets are less inclined to issue debt and so there is negative relationship between liquidity of the firm and financial leverage. So firms with high liquidity ration may have low debt equity ratio. Liquidity has defined as **current asset to current liabilities** and the same has been measured by earlier researchers T. Mallikarjunappa (2007), Mehadi Ebadi(2011), Franklin John (2011), Mary Dawood (2011).

### 3.6) Statistical design :-

Researcher has used following statistical technique for data analysis.

- **Regression** – To predict the relationship between variables.
- **ANOVA** – To test the good fit of the model.

Also for data analysis with these statistical technique advance excel is used.

### 4) Findings of the study

This study has examined the determinants of capital structure and how they behave with varying size of the business in Indian pharmaceutical companies. The following tables are showing multiple regression results for all seven categories and their interpretation.

#### 4.1) Multiple regression results for up to Rs. 500 million size of the business

**Table No. 02 - Multiple regression results**

INTERCEPT	SZ	PRFT	TG	NDTS	GRWTH	LIQ	ICR
4.12 (0.00)	-0.18 (0.00)	0.10 (0.37)	-0.41 (0.04)	0.69 (0.07)	0.00 (0.80)	-0.09 (0.00)	0.00 (0.49)
R <sup>2</sup>	F VALUE	ANOVA SIGNIFICANCE					
0.14	3.64	0.00					

In this category average debt finance has 30% of total asset during study period and model predicted 14% in financial leverage. F value shows overall model is good and null hypothesis is rejected. It has found out that, size of business, tangibility, liquidity is having negative and

significant determinants of financial leverage. As the predictability of this model is very weak the comments associated with the model is also weak.

#### 4.2) Multiple regression results for size of the business: - Rs. 501 to 1,000million

Table No. 03 - Multiple regression results

INTERCEPT	SZ	PRFT	TG	NDTS	GRWTH	LIQ	ICR
2.02 (0.06)	-0.08 (0.12)	2.15 (0.03)	-0.24 (0.06)	-2.06 (0.36)	-0.00 (0.33)	0.10 (0.11)	-0.03 (0.00)
R <sup>2</sup>	F VALUE	ANOVA SIGNIFICANCE					
0.50	4.15	0.00					

In this category on an average 35% of asset has financed by debt and model has predicted 50% of variability in financial leverage. F value shows overall model is good and null hypothesis is rejected. Only profitability with positive sign and Interest coverage ratio with negative sign has found significant relationship with financial leverage. It indicates that as profitability increases by 1 units companies in this group increase their debt by 2.15 units to support further investment. So companies in this category first exhaust their profit and to meet the investment gap borrow. As interest coverage ratio increases by one unit financial leverage decreases by 0.03 units.

#### 4.3) Multiple regression results for size of the business: - Rs. 1,001 to 1,500 million

Table No. 04- Multiple regression results

INTERCEPT	SZ	PRFT	TG	NDTS	GRWTH	LIQ	ICR
0.91 (0.53)	-0.03 (0.61)	-0.68 (0.02)	-0.05 (0.80)	4.79 (0.08)	0.00 (0.90)	0.09 (0.14)	0.00 (0.03)
R <sup>2</sup>	F VALUE	ANOVA SIGNIFICANCE					
0.34	2.55	0.03					

In this category average 28% of total asset has financed by debt and model has 34% predictability of financial leverage. F value shows overall model is good and null hypothesis is rejected. Only profitability has found significant relationship with financial leverage having negative sign. It indicates that companies in this category follow pecking order theory of capital structure and as per theory first firm uses internally generated funds, then debt and equity as last resort. Negative relationship between profitability and financial leverage proved the presence of pecking order theory proposed by Stewart C. Myers. So as profitability of firm increases by one unit firm reduces its debt by -0.68 units. Interest coverage ratio has also found significant determinant but failed to prove its direction.

**4.4) Multiple regression results for size of the business: - Rs. 1,501 to 2,000million****Table No. 05 -Multiple regression results**

INTERCEPT	SZ	PRFT	TG	NDTS	GRWTH	LIQ	ICR
-0.89 (0.06)	0.05 (0.02)	0.14 (0.44)	0.57 (0.00)	-8.04 (0.00)	0.00 (0.00)	-0.02 (0.29)	0.00 (0.01)
R <sup>2</sup>	F VALUE	ANOVA SIGNIFICANCE					
0.64	7.86	0.00					

In this category 23% of total asset has financed by debt and model predict 64% variability in financial leverage. F value shows overall model is good and null hypothesis is rejected. Size of business, tangibility shows significant and positive relationship with financial leverage. Non debt tax shield is significant determinant of financial leverage and having negative sign. Growth in asset and interest coverage ratio are also found significant determinants but failed to predict the direction. It shows companies in this category use debt more with growing size and tangibility of the business. So as size of business increases by 1 unit debt increases by 0.05 unit. As tangible asset are used for mortgage against debt, the debt increase with growing tangibility and result shows that as tangibility increases by 1 unit debt increases by 0.57 unit. Also non debt tax shield has shown negative sign indicates that the growing tangible asset supports depreciation deduction benefit for companies. But companies with growing depreciation benefit with non debt tax shield and reduce debt in capital structure.

**4.5) Multiple regression results for size of the business: - Rs. 2,001 to 2,500million****Table No. 06- Multiple regression results**

INTERCEPT	SZ	PRFT	TG	NDTS	GRWTH	LIQ	ICR
2.62 (0.02)	-0.11 (0.02)	-1.33 (0.05)	0.62 (0.02)	1.32 (0.66)	0.00 (0.41)	-0.04 (0.40)	0.02 (0.10)
R <sup>2</sup>	F VALUE	ANOVA SIGNIFICANCE					
0.91	6.35	0.04					

In this category 40% of total asset financed by debt and model shows 91% variability in financial leverage. F value shows overall model is good and null hypothesis is rejected. Size and profitability shows significant and negative relationship with financial leverage and tangibility is having significant and positive relationship with financial leverage. The negative relationship between size and leverage indicates that small size firms have more debt than large size firms. In this category, as sales and profit grows by 1 unit companies use retained earnings to finance their



operations over debt and reduces debt by -0.11 and -1.33 respectively and as tangibility increases by 1 unit their debt in capital structure increases by 0.62 unit.

#### 4.6) Multiple regression results for size of the business: - Rs. 2,501 to 3,000million

Table No. 07- Multiple regression results

INTERCEPT	SZ	PRFT	TG	NDTS	GRWTH	LIQ	ICR
-2.39 (0.03)	0.14 (0.00)	-1.31 (0.04)	-0.32 (0.14)	2.59 (0.48)	0.00 (0.36)	0.02 (0.49)	-0.02 (0.01)
R <sup>2</sup>	F VALUE	ANOVA SIGNIFICANCE					
0.53	6.13	0.00					

In this category, 40% of total asset has financed by debt and model shows 53% variability in financial leverage. F value shows overall model is good and null hypothesis is rejected. Size has found positive and strong relation with financial leverage with 0.14 coefficient. Profitability and interest coverage ratio has found has found -1.31 and -0.02 coefficient respectively and both have significant relationship with financial leverage. As sales increases companies in this category rely more on debt to support further investment but when profitability increases companies use first retained earnings to support operations over debt and if additional funds are required they use debt and equity as last resort.

#### 4.7) Multiple regression results for size of the business: - Rs. 3,001 and above

Table No. 08- Multiple regression results

INTERCEPT	SZ	PRFT	TG	NDTS	GRWTH	LIQ	ICR
4.12 (0.00)	-0.18 (0.00)	0.10 (0.37)	-0.41 (0.04)	0.69 (0.07)	0.00 (0.80)	-0.09 (0.00)	0.00 (0.49)
R <sup>2</sup>	F VALUE	ANOVA SIGNIFICANCE					
0.14	3.64	0.00					

In this category 30% of total asset has financed by debt and model has explained 14% variability in financial leverage. F value shows overall model is good and null hypothesis is rejected. Size of the business, tangibility and liquidity are negative and strong determinants of financial leverage. As the predictability of this model is very weak the comments associated with the model is also weak.

## 5) Conclusion

After theory on capital structure published by Modigliani and Miller (1958), various articles have contributed on capital structure. All theories have failed to build a uniform model for prediction of capital structure. In this paper capital structure determinant has studied in innovative way by classifying them on the basis of firm size. The study has conducted particularly in 88 Indian pharmaceutical companies listed on BSE. The period of study was 2006 to 2011. The capital structure has measured as financial leverage. Other determinants of capital structure included are size of the business, tangibility, profitability, growth in asset, liquidity, interest coverage ratio and non debt tax shield. In this study companies are classified in seven categories on the basis of the size of the business. By classifying 88 companies on the basis of their size of business it has found that determinants of capital structure are not common in all seven categories. So this study has concluded by, determinants of capital structure vary with the size of the business in Indian pharmaceutical companies.

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