
Factors Effecting Capital Structure of Pharma Firm in India: A Case Study of firm's listed on CNX Index of NSE

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ABSTRACT:

Capital Structure refers to mixture of long term sources of the fund of the company. Researcher in the corporate finance has devoted extensive time and effort to determine the cause effect relationship of determinants of capital structure and its mix. But even after fifty five years of modiglian and miller theory cause effect relationship of factors effecting of capital structure and its mix is a puzzle. The present paper attempts to examine the capital structure mix and its determinants of Pharma Company in India .The study used econometric tools to analyze the determinant and mix of capital structure and developed a model to define the relationship of capital structure and its determinant. Statistical analysis used in the study involves both descriptive and inferential study. The study reveals that the pharma companies are following the peaking order hypothesis in its capital structure mix. Tangibility and Liquidity are the two important determinants of capital structure mix.

Key Word: *Capital Structure, Determinants of Capital Structure, Econometric tools,*

1. INTRODUCTION:

Capital Structure refers to the mix of long term sources of fund of the firm. The traditional long term sources of the fund are equity capital, preference capital, bank loan, debentures etc. The long term fund can be raised internally through reserve, equity and preference share and externally through various debt products. Researcher in the corporate finance has devoted extensive time and effort to determine cause effect relationship of the determinant of capital structure and its mix. After the seminal work by modiglian and miller in 1958 number of research has taken place to study the structure and determinant of capital structure. But even after fifty five years of modiglian and miller theory cause effect relationship of factors of capital structure and its mix is a puzzle .There are many empirical research conducted on developed countries but still there is lack of research on emerging economy like India. The financial market of emerging economy is still in the nascent stage and dominated by traditional capital products. There is also lack of research to determine the developing country specific, industry specific and firm size specific research to further strengthen the subject. Cause effect relationship of factors effecting the capital structure and its mix is big debate in emerging economy.

The Pharmaceutical Industry in India is the world's third largest in terms of volume. The industry is expected to touch US \$ 3.6 billion by end of 2016. The Industry is expected to grow @ 10 to 12% during the financial year 2013-14 according to study of ICRA. Indian's Pharma Sector has received FDI of \$ 1 billion, the highest among top ten segment, during April to June during current financial year. Pharma Industry is one of the growing Industry in India even Indian economic is not doing well. Understanding the importance of growth of

Pharma Sector for economy of India the government of India current permits 100% FDI in Pharma Sector through automatic route in new project and after approval of Foreign Investment Promotion Board in existing company. It is important for the Pharma company to finance its existing and growth activities if they are to play an important role in the development of nation. It is important in this regard to understand how Pharma Company in India has financed its operation by examining its capital structure and its determinants.

The present paper attempts to study the capital structure mix and its determinant of Company's listed on CNX Pharma Index based on panel data from financial year 2011 to 2013. The study uses econometric tools to analyze the determinant and mixture of capital structure and attempt to develop a model to define the relationship of capital structure and factors affecting it.

The paper is divided into nine sections. Objective of the study is discussed in second section and literature review in third section. In fourth section hypothesis is discussed, in fifth section methodology of the study is discussed, in sixth section result and analysis is discussed, in seventh section limitation of the study is discussed and finally in eighth section conclusion is given. But without due acknowledgement the paper is not complete in ninth section acknowledgement is given.

2. OBJECTIVE: The study attempt to seek more specially the answer to followings question:

- a) To Study the characteristic of existing mixture of capital structure of companies listed on CNX Pharma Index and to test the "pecking order" of borrowing among alternative sources.
- b) To study the leverage position of CNX Pharma firm and factors effecting it.
- c) To develop a relationship model for leverage of CNX Pharma Firm and its determinants.

3. LITERATURE REVIEW:

We have reviewed some of the theories and empirical studies published in the relevant literature concerning the developed and emerging economy. Franco Modigliani and Merton H. Miller (1958) argued that value of firm is independent of capital structure under certain conditions.

Titman and Wessels (1988) extend the theories that have different empirical implications; measures of short-term, long term, and convertible debt rather than an aggregate measure of total debt. They found debt levels are negatively related to the "uniqueness" of a firm's line of business. They contended that the transaction costs may be an important determinant of capital structure choice. Short-term debt ratios were shown to be negatively related to firm size, possibly reflecting the relatively high transaction costs small firms face when issuing long-term financial instruments. Barton and Gordon (1988) suggest that a managerial choice perspective may help to explain capital structure choice at the firm level of analysis

Rajan and Zingales (1995) studied that financing decision of public firm in major industrialized countries. They concluded that firm leverage is fairly similar across G-7

countries and difference that exist are not easily explained by institutional difference previously through important. Kakani and Reddy (1998) attempt to study the empirical examination of theories on determinant of capital structure in developing economics such as India. The results were found to be fairly different from the empirical findings done in developed economics. The firm's diversification strategy and size were found to be of no significant in deciding the leverage level of the firm. Profitability and Capital Intensity were found to be most significant factors in deciding the leverage level of the firm.

Laurence booth, Varouj Aivazian, Asli Demircug-Kunt and Vajislav Maksimoric (2001) studied the capital structure choice of firms in ten developing countries. They found out that the variables that are relevant for explaining the capital structure in United States and European countries are also relevant for developing countries despite the profound differences in Institutional Factors across developing countries. They argued that there are persistence difference across countries indicating that specific country factor are at work and much remain to be done to understand the impact of difference institutional features on Capital Structure choice.

Fama and French (2002) argued that motivated by different forces, the pecking order and trade off, two models share many predictions about dividends and leverage. The two models predict that controlling for other effects, more profitable firms have higher dividend payouts, and firms with more investments have lower payouts. There are positive relations between leverage and firm size, and between dividend payout and size

Saumitra N. Bhaduri (2002) studied that determinant of corporate borrowings of Indian Corporate. Bhaduri study consisted of 363 firms collected across nine broad industries over the period of 1990-1995 and is drawn from the Centre for Monitoring Indian Economy (CMIE) database He concluded that capital structure choice in India is influenced by factors such as growth, cash flow, size and product and industry characteristics.

Song (2005) studied capital structure determinants of Swedish firms based on a panel data set from 1992 to 2000 comprising about 6000 companies. The results indicate that most of the determinants of capital structure suggested by capital structure theories appear to be relevant for Swedish firms. But we also find significant differences in the determinants of long and short-term forms of debt.

Bhayani (2005) examined the capital structure of the Indian firms for a sample of 504 Indian companies listed on any Stock Exchange of India during 1994–95 2003–04 .He concluded that a large proportion of fixed assets tend to maintain a higher debt ratio than smaller firms. Furthermore, larger firms employ more debt capital in comparison with smaller firms and firms with high profitability ratios tend to use less debt than firms that do not generate high profits. Also firms do not follow target capital structure during the examined period.

Yuanxin Liu & Jing Ren (2009) studied the determinants of corporate financial structure for the IT industry in China. They found that the corporation size and capital structure have positive correlation but this kind of correlation is not significant. The profitability and capital structure has negative correlation. Liquidity and capital structure has negative correlation.

C.S. Misra (2011) attempt to study the capital structure determinants of central PSUs in India. The results suggest that the capital structure (Total Borrowing to Total Assets) of the profit making PSUs is affected by Asset Structure (Net Fixed Assets to Total Assets, NFATA), Profitability (Return on Assets, ROA) and Tax. Unlike suggestion of pecking order hypothesis, growth is positively related to leverage. In contradiction to theory tax and leverage are negatively related. Firms with less effective tax rate have gone for more debt. None of the other variables like non-debt tax shield (NDTS), Volatility, Size were found to be significant. The tangibility measured by the ratio of net fixed assets to total assets is found to be positively related to leverage.

Afza and Hussain (2011) examines the industry specific attributes of firms in Automobile, Engineering, and Cable and Electrical Goods Sectors affecting the determinants of capital structure in Pakistan. The result suggest that the firms of these three sectors with good liquidity position and large depreciation allowances use retained earnings, followed by debt financing for growth and smooth operations and equity financing is considered as a last resort. The firms of these sectors with reasonable depreciation allowance do not prefer debt financing when tax shield on depreciation is already available and is consistent with static trade off theory.

ADEYEMI and OBOH (2011) examined the empirical effects of corporate capital structure on the market value of a selection of firms listed on the Nigerian Stock Exchange. The results of the study suggested that a positively significant relationship exists between a firm's choice of capital structure and its market value in Nigeria.

Koksal, Orman and Oduncu (2013) studied the capital structure of non-financial firms in a major emerging market economy, Turkey. They concluded that tax-related factors and asset tangibility are the most economically significant factors for short-term and long-term debt ratios, respectively. They also suggested that inflation is an important determinant of leverage and the most economically significant macroeconomic factor.

4 Hypothesis of the Study : The hypothesis of the study are given in Table 2 as below :

Table 2: Hypothesis of the Study

Sl no.	Hypothesis of the Study
H ₀₁	There is negative relationship between liquidity and Total Leverage.
H ₀₂	There is positive relationship between tangibility and Total Leverage.
H ₀₃	There is positive relationship between growth and Total Leverage.
H ₀₄	There is positive relationship between size of the firm and Total Leverage.
H ₀₅	Firm with higher amount of depreciation will have lower Total Leverage ie. Negative relationship between depreciation and leverage
H ₀₆	Earning Volatility will have negative effect on Total Leverage
H ₀₇	Age of the firm and Total Leverage is positively related

5. METHODOLOGY—

a. Data Collection: The period from FY 2010-11 to 2012-13 were considered for the purpose of the study. In some cases financial results were available calendar year wise. We have included the data calendar year wise i.e 2011, 2012 and 2013 as long as financial result was available for 12 months. The standalone financial result of the firm's are considered for the purpose of the Study. The financial result used for the purpose of the study was obtained from web site of the respective company and moneycontrol.com

b. Sampling Design: The study is limited to company's part of CNX Pharma Index of NSE. The CNX Pharma Index comprises of 10 companies as on date and CNX Pharma Index captures the performance of pharma sector. All the 10 companies part of CNX Pharma Index were considered for the purpose of the Study. Our study consists of 30 Pharma Year and Table 1 details about the company considered for the purpose of the study.

Selected Variable :

Dependable variable used in the study are followings –

Total Leverage (TL) –Total Leverage is defined as total outstanding outside liability i.e. Long Term Debt plus Current Liabilities divided by equity i.e Total Outside Liability/ Equity

The independent variables used in our study are followings-

1. **Tangibility /Collateral Assets:** The tangibility for Long term Leverage is defined as Net Fixed Assets. The tangibility for total leverage is defined as Net Fixed Assets plus 50 % of Current Assets. At the time of giving cash credit facility /short term loan (considered in current liabilities) to firm Banks generally consider 50 % value of the current assets as security. Hence we have defined tangibility for total leverage as Net Fixed Assets plus 50 % of the current assets. The natural log of tangibility is used in the study.
2. **Growth:** Growth is defined as percentage change in sales i.e. compound annual growth rate from the period 2010 to 2013.
3. **Size :** Size is defined as natural log of total assets
4. **Liquidity :** Liquidity is defined as natural log of (PAT + Deprecation)
5. **Non Debt Tax Shield (NDTS):** It is defined as Depreciation/Total Assets
6. **Income Variability:** It is measure as variability on Return on Assets i.e EBDIT to Total Assets.
7. **Age of the Firm:** It is calculated as age of the firm from date of incorporation given in table 1 as on particular financial year.

c. Mode of Analysis: Descriptive statics are used to describe and summaries the behavior of the variable in the study. Correlation and regression statics are used to understand and define the relationship between selected variables. Statistical analysis used in the study involves both descriptive and inferential study. Dixon test is used on the selected variable to test the outlier and XLSTAT statically analysis software trial version is used to analyze the data.

d. Research Model: Correlation coefficient is computed for variables to study the nature and extent of relationship. Multiple regression techniques have been applied to study the joint influence of independent variable on dependent variable. The present study uses panel data Constant Coefficient Model. The regression equations is as below:

Model

$LEV TL = \beta_0 + \beta_1 \text{Log (TANGIBILITY)} + \beta_4 \text{Log (LIQUIDITY)} + \beta_2 \text{GROWTH} + \beta_3 \text{Log(SIZE)} + \beta_5 \text{NON DEBT TAX SHIELD} + \beta_6 \text{INCOME VARIABILITY} + \beta_7 \text{AGE OF FIRM} + \epsilon_i$

Where,

LEV TL=Total Leverage, ϵ =Error Term AND $\beta_0 \dots \beta_7$ are the coefficient.

The variable are as previously defined above. This model is used by Ranjan and Zingales (1995) but he has used independent variable as tangible assets (fixed assets to total assets) , market to book value, log sales and return on assets . Our model is different from Ranjan and Zingales as we have used different definition of tangibility, added variable like growth, age, income variability and liquidity in our model. We have studied the joint influence of independent variable on dependent variable with the help of above model.

6. RESULT & ANALYSIS

a. Descriptive Statics :

The descriptive statics of the selected variable has been computed using the statically software XLSTAT trail version. The descriptive statics of the selected variable is shown in table 3 below:

Table : 3- Descriptive statics of the selected variable

Variable	Observations	Minimum	Maximum	Mean	Std. deviation
Total Leverage	29	0.002	2.478	0.264	0.475
Liquidity	29	3.171	8.226	6.451	1.094
Tangibility	29	5.710	8.606	7.452	0.834
Growth	29	-0.400	0.447	0.154	0.215
NDTS	29	0.005	0.031	0.017	0.009
Income Variability	29	0.000	0.706	0.038	0.136
Age of the firm	29	15.890	88.438	42.626	25.020

The minimum total leverage is 0.002 indicates a very low level of borrowings and maximum leverage is 2.478 indicates aggressive borrowings. The average leverage of 0.264 indicates low level of borrowings by the CNX Pharma Company. Dixon test for outlier was conducted to test any outlier in the data . The summary of Dixon test is table 4 below :

Table : 4- Summary of Dixon Test

R10 (Observed value)	0.149
R10 (Critical value)	0.301
p-value (Two-tailed)	0.492
Alpha	0.05

29 pharma years were used in the study as one year data of the firm was removed from the study to eliminate the effect of outlier. As computed p-value is greater than significance level 0.05 in table 4 (Dixon Test) it indicates there is no outlier in the data.

The funding pattern of the firms during the period of study is summarized in Table 5 as below :

Table : 5-Funding Pattern of Pharma Firm

Particulars	FY-2012-13/2012	FY-2011-12/2011	FY-2010-11/2010
% of Equity Capital	1.40%	1.62%	1.64%
% of share Application	0.00%	0.00%	0.01%
% of Preference Capital	0.00%	0.00%	0.00%
% of Reserve	76.87%	82.11%	82.02%
% of Loan	21.73%	16.27%	16.33%
Total	100.00%	100.00%	100.00%

The above funding pattern of CNX Pharma Index Company's indicates that company is funded first from internal reserves than by loan and than by equity. The result is similar to the peaking order theory of capital structure. But preference share is not the choice of the company. The reason may be in Indian as per corporate law one can't issue irredeemable preference share or preference share redeemable after 20 years. This makes the preference share unattractive as it does not have quality of permanency like equity capital and firm are relying more on equity capital than preference capital. The summary of secured and unsecured borrowings is given in Table 6 below:

Table : 6-Break up of Secured and Unsecured borrowings

Particulars	FY-2012-13/2012	FY-2011-12/2011	FY-2010-11/2010
Secured Borrowings	20.90%	21.55%	19.53%
Unsecured Borrowings	79.10%	78.45%	80.47%

The above summary suggests that CNX Pharma Company's more relaying on unsecured borrowings than secured borrowings. Average 20% of the borrowings of CNX Pharma company is secured. Due to high liquidity and growth it is possible for them to get unsecured loan or arranging unsecured loan in the nature of quasi capital. The summary of short term and long term borrowings of CNX Pharma company is given in Table 7 below:

Table : 7-Summary of Short Term and Long Term Borrowings

Particulars	FY-2012-13/2012	FY-2011-12/2011	FY-2010-11/2010
Long Term Borrowings	24.57%	29.78%	21.00%
Short Term Borrowings	75.43%	70.22%	79.00%
Total	100.00%	100.00%	100.00%

The above table clearly shows that CNX Pharma firms are relying more on short term borrowings than long term borrowings.

b. **Correlation Analysis** : The summary of correlation analysis test is given in table 8 below :

Table : 8 Correlation Analysis of Selected Variable

Variables	Liquidity	Tangibility	Growth	NDTS	Income Variability	Age of the firm	TL
Liquidity	1.000	0.302	0.206	0.413	0.113	-0.137	-0.581
Tangibility	0.302	1.000	0.001	0.705	-0.185	-0.182	0.252
Growth	0.206	0.001	1.000	0.351	-0.561	-0.324	-0.196
NDTS	0.413	0.705	0.351	1.000	-0.332	-0.264	-0.014
Income Variability	0.113	-0.185	-0.561	-0.332	1.000	0.240	-0.089
Age of the firm	-0.137	-0.182	-0.324	-0.264	0.240	1.000	-0.039
TL	-0.581	0.252	-0.196	-0.014	-0.089	-0.039	1.000

The above table indicates the relationship between dependent and independent variable used in the study. The summary correlation analysis in table 8 indicates that the liquidity, growth, NDTS, Income Variability and Age of the firm is negatively related to the total leverage and tangibility is positively related to the total leverage. Age, Income Variability and NDTS is having weak co relation with Total Leverage.

c. **Regression Analysis** : The regression analysis has been conducted on the variable and model summary and model parameter is as given in Table 9 as below :

Table : 9 Summary of Multiple Regression Model

Observations	29.000
Sum of weights	29.000
DF	22.000
R ²	0.554
Adjusted R ²	0.432

Source	DF	Sum of squares	Mean squares	F	Pr > F
Model	6	3.499	0.583	4.549	0.004
Error	22	2.821	0.128		
Corrected Total	28	6.320			

Source	Unstandarized Value	Standard error	T	Pr > t	Standarized Value
Intercept	0.174	0.909	0.191	0.850	-
Liquidity	-0.317	0.074	-4.277	0.000	-0.729
Tangibility	0.303	0.126	2.410	0.025	0.532
Growth	0.011	0.451	0.025	0.981	0.005
NDTS	-4.269	12.163	-0.351	0.729	-0.084

Income Variability	0.304	0.669	0.455	0.654	0.087
Age of the firm	-0.002	0.003	-0.543	0.592	-0.083

The model equation is as below:

TL= 0.174-0.317 Liquidity +0.303 Tangibility +0.011 Growth -4.269 NDTs+0.304 Income Variability -0.02 Age

The R^2 is 55.40 % and adjusted R^2 43.20 % indicates the level of variation in leverage explained by the selected independent variable. The P value of the model is less than 0.05 indicates the significance of the model and model can be accepted. Therefore, the robustness (R^2) of the model was healthy. The standardized coefficient indicates the liquidity and tangibility is having high importance in the model compare to other factors.

Finally, VIF and tolerance has been done to avoid Multicollinearity. It is statically accepted than VIF of equal to or more than 1 less than 5 indicates no significant multi-collinearity or serial correlation. In our model when size and tangibility both was used tangibility was having VIF more than 5 and size was having VIF 4.126. Hence to remove the effect of multi-collinearity we have removed the size from our model and after removing the size all variable was having VIF less than 3 indicates no significant multi-collinearity or serial correlation. Table 10 & 11 shows tolerance and VIF of the independent variable including size and without including size.

Table 10- Tolerance and VIF when Tangibility and Size was part of model

Statistic	Liquidity	Tangibility	Growth	Size	NDTS	Income Variability	Age of the firm
Tolerance	0.647	0.144	0.489	0.242	0.277	0.399	0.829
VIF	1.545	6.939	2.045	4.126	3.606	2.507	1.207

Table 11- Tolerance and VIF size was removed from the model.

Statistic	Liquidity	Tangibility	Growth	NDTS	Income Variability	Age of the firm
Tolerance	0.698	0.416	0.489	0.357	0.551	0.860
VIF	1.433	2.406	2.045	2.804	1.815	1.163

d. **Hypothesis Testing** : Finally, the hypothesis is tested in Table 12 as below :

Table : 12-Hypothesis Testing

Sl no.	Hypothesis of the Study	Test of Hypothesis	Result
H ₀₁	There is negative relationship between liquidity and Total Leverage.	Co regression of -0.581 and regression coefficient of -0.317	Null hypothesis is accepted. The result is consistent with information asymmetry theory and pecking order hypothesis.
H ₀₂	There is positive relationship between	Co regression of 0.252 and regression	Null hypothesis is accepted. The result is consistent with

	tangibility and Total Leverage.	coefficient of 0.303	information asymmetry theory. The result is consistent with result of Booth et al (2000) studies
H ₀₃	There is positive relationship between growth and Total Leverage.	Co regression of -0.196 and regression coefficient of 0.011	The co regression and regression co efficient result is mixed. The result of regression co efficient is not statically significant. Hypothesis is rejected as per co regression result. But the result is against the agency theory.
H ₀₄	There is positive relationship between size of the firm and Total Leverage.	NA	NA as it was removed from the model to avoid Multicollinearity.
H ₀₅	Firm with higher amount of depreciation will have lower Total Leverage ie. Negative relationship between depreciation and leverage	Co regression of -0.014 and regression coefficient of -4.269	Null hypothesis is accepted.
H ₀₆	Earning Volatility will have negative effect on Total Leverage	Co regression of -0.089 and regression coefficient of 0.304	The co regression and regression co efficient result is mixed. The result of regression co efficient is not statically significant. Hypothesis is accepted as per co regression result.
H ₀₇	Age of the firm and Total Leverage is positively related	Co regression of -0.039 and regression coefficient of -0.002	Null hypothesis is accepted. The result is consistent with information asymmetry theory. But result is not showing strong significant relationship.

7. LIMITATION OF THE STUDY:

The study is restricted to CNX Pharma Index Company. It is assumed all firms have same business risk and same capability to raise the finance. The Study was conducted based on published annual accounts of the company i.e secondary data. The other data collection method has not been considered.

8. CONCLUSION:

We conclude that capital structure of companies listed on CNX Pharma Index is following pecking order theory and financed in order of retained earnings, debt and equity capital. The lack of preference share in its capital structure is due to country specific regulation in India. Due to high liquidity and growth prospectus CNX Index Pharma firm are financed more by unsecured loan than secured loan. Also firm are relying more on short term loan than long term loan. Tangibility and liquidity are two very important determinants of capital structure of the firm's in the regression model.

There is clearly scope for further research by including more variable in the model to explain the cause effect relationship between leverage and factors affecting it. Qualitative factors like management physiology are very important in deciding the leverage of the firm. The future research should focus more on these factors also. Our study was based on CNX Pharma Index and further research should be done more on industry specific and organization size specific to enhance our knowledge on capital structure.

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Table 1: List of Companies Listed on CNX Pharma Index of NSE, Financial Year and Pharma Year USED in the Study

l no	Company Name	Date of Incorporation	Financial Year	Total Pharma Year
1	Cadila Healthcare Ltd.	15-05-1995	2010-11,2011-12,2012-13	3
2	Cipla Ltd.	17-08-1935	2010-11,2011-12,2012-13	3
3	Divi's Laboratories Ltd.	12-10-1990	2010-11,2011-12,2012-13	3
4	Dr. Reddy's Laboratories Ltd.	24-02-1984	2010-11,2011-12,2012-13	3
5	Glaxosmithkline Pharmaceuticals Ltd.	13-11-1924	2010,2011 and 2012	3
6	Glenmark Pharmaceuticals Ltd.	18-11-1977	2010-11,2011-12,2012-13	3
7	Lupin Ltd.	01-03-1983	2010-11,2011-12,2012-13	3
8	Piramal Enterprises Ltd.	26-04-1947	2010-11,2011-12,2012-13	3
9	Ranbaxy Laboratories Ltd.	16-06-1961	2010,2011 and 2012	3
10	Sun Pharmaceutical Industries Ltd.	01-03-1993	2010-11,2011-12,2012-13	3
			Total Pharma Year	30