An Analytical Study on Determinants of Capital Structure Composition During the Post Liberalization Period in India

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Abstract

This paper analyzed the capital structure composition of firms during the post financial liberalization period in India. The study used data of 41 Indian listed firms excluding financial services firms listed on Nifty indices on National Stock Exchange over a time frame of 14 years. The dependent variables taken for financial leverage were EBITDA to interest expense, equity to total assets, and long - term debt to total assets. The capital structure composition was studied across various dimensions, that is, profitability, tangibility, growth, size, volatility, ownership pattern, etc. along with other external dimensions such as taxation policy. Data analysis was done using descriptive statistics, correlation, and stepwise regression analysis. Three different models were constructed for analysis through stepwise multiple regression to deduce a unique set of explanatory variables that affected the leverage measure of firms. These models helped to analyze the maximum number of significant factors that had an impact upon the capital structure composition during the post liberalization period in India. The findings of this study suggested that all the explanatory variables studied in the three models were statistically significant with leverage. The results showed that there was an impact of financial liberalization on capital structure composition. ln(EBITDA to interest expense) explained the maximum variation in the capital structure composition after liberalization followed by ln(equity to total assets).

Key words : **financial liberalization, capital structure, financial leverage**

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Firms have been struggling for the past many decades and still do to get the right capital structure. However, what is the right capital structure itself has been a debatable topic for years. Capital structure has evolved over the decades. The capitalist firms these days are one of the key economic establishments in today's contemporary economy. Hence, the impact and analysis of their financial performance post financial liberalization is enormously significant. The financial repression of the 1970s and 1980s brought forth some new financial factors such as costs, interest rate control on deposit and lending, credit ceilings, subsidized credits, and liquidity requirements among other widely used interventions today. It was the phase of economic liberalization of developing countries during 1980s -1990s which also led to greater development of respective markets that provided answers to these new recognized financial factors. In general, the term financial liberalization has got many definitions in different financial literatures. The term financial liberalization consists of deregulation of -

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foreign sector capital account, the domestic financial sector, including the stock market. Rostow (1973) stated that financial liberalization provided an incentive to domestic investors to accumulate more equity capital and lower the costs of borrowing.

In the 1980s, India faced a severe foreign exchange crisis due to abnormal hike in petroleum prices, which was stressed out by flight in NRIs' deposits. So, we had to take several measures of economic reforms for internal and external liberalization. India liberalized its financial sector in the 1990s with several steps for success in capital markets. Until 1992, India faced several problems with regard to access to corporate funding. The equity markets were governed by Controller of Capital Issues (CCI), an organization under the Department of Company Affairs which imposed stringent regulations and rules with regard to equity fund raising. On the debt front, long term funding was under the purview of Development Financial Institutions (DFIs), which monopolized the debt funding. Financial liberalization was part of major reliance on the private sector after the 1991 foreign exchange crisis. It was in May 1992 that CCI was abolished, and the access to the equity markets became less stringent. With regard to stock markets, liquidity and informational asymmetry were improved. Parallel in debt segment, interest rates were deregulated, bank regulations and supervision were strengthened, and non banking financial corporations (NBFCs) were allowed under easier regulations (The World Bank, 2005). A new beginning was marked by the introduction of prudential norms for non performing assets, provision for bad debt, and classification of assets and recognition of income. The privatization of banks started with government reducing its stake in financial institutions. However, a parallel serious threat also emerged to the public sector companies on account of governments' reluctance to fund losses, keenness to privatize them, and reduction in preferential treatment to them in government purchases etc.

Post 1991, one after another capital market crisis, regulations were strengthened, listings were liberalized, foreign investors were allowed in, and physical infrastructure was substantially improved. Since then, the capital structure of firms has evolved and has distinguished itself in a significant manner.

According to the empirical capital structure theory of Modigliani and Miller (1958), the capital structure of a firm does not affect its value. The assumption of perfect markets leads to impediments that limit a firm from achieving the desired target leverage level. Some of these impediments are high transaction costs, taxes, and flotation costs. In a non liberalized economy, firms have limited financing options and higher transaction costs ; contrary to a firm operating in a liberalized economy.

The trade off theory illustrated about the trade-off between the proportion of debt and equity in a firm's capital structure. Furthermore, Myers and Majluf (1984) illustrated that the firms that follow a trade off theory have leverage targets. The pecking order theory is based on the assertion that managers are more informed about their firms than the investors. The pecking order theory illustrates an inverse relationship between profitability and debt ratio within the industry.

Harris and Raviv (1991) suggested that leverage increases with fixed assets, non debt tax shields, growth prospects, and size ; whereas, it decreases with volatility, advertising expenditure, research and development, and profitability. On the other hand, Titman and Wessels (1988) did not provide support for effect on leverage ratios occurring from non debt tax shields, collateral, and growth prospects of a firm.

In the 1980s, firms took extra leverage due to the market pressure for corporate control. In the beginning of the 1990s, small-sized firms used publicly traded equity financing. It is essential to study these changes in financing patterns over time. It is argued that different capital structure theories apply to firms under different circumstances.

Literature Review

What is the impact of financial liberalization on capital structure composition ? Liberalization has moved along

two axes ; firstly, relaxation in price and quantity restrictions and secondly, easing of boundaries in financial actions.

Corporate finance has incorporated several factors that impact the composition of capital structure. The present literature discusses the impact of liberalization on internal and external factors. These factors can also be termed as firm level and economy level factors. King and Levine (1993) found a positive impact on growth prospects and opportunities. Capital structure decisions are imperative for the survival and growth of any firm because incorrect decisions have negative outcomes like financial distress, bankruptcy, or liquidation (Najjar & Petrov, 2011). Srivastava (2012) observed in his study that total debt to total assets and long term debt to total assets against six explanatory variables namely firm size, asset structure, NDTS, cash, growth opportunities, and profitability found dramatic change in the explanatory power as the value of R^2 was .93 and .98 for the same variable in the pre liberalization period ; whereas, the values were .86 and .80 for post liberalization. It showed that variables had varied importance in various time periods as confirmed by the Chow test.

Kumar (2002) found that the trends for foreign trade in terms of exports and imports in India were not encouraging and immediate, so major steps are required to meet the challenges post liberalization. Chipeta (2012) concluded that lifting of international sanctions and the opening of the Johannesburg Stock Exchange to foreign investments lowered the book and market value of firms' debt ratio. The author observed that the effect was more prominent for larger firms than it was for smaller firms. This is consistent with Myers and Majluf's (1984) assertion that information asymmetries are lower for larger firms ; hence, it is not surprising that large firms respond more to stock market liberalization. Chipeta, Wolmarans, and Vermaak (2012) in their study examined the model dynamics of capital structures for listed non-financial firms in South Africa. The dynamic model found several findings of empirical significance. First, transaction costs reduced dramatically in the post liberalization regime, and the associated speed of adjustment was more pronounced and statistically significant for the post liberalization epoch. Second, financial liberalization had a significant impact on the capital structure's speed of adjustment. Third, the results confirmed most of the theoretical predictions of capital structure theories, however, the relationship was more significant in the post liberalized regime. Ghosh and Neogi (1998) argued that productivity growth and efficiency level did not enhance as per the expectations during the post-reform period and the distribution of efficiency was skewed.

Rajan and Zingales (1998) found that industries in developed economies grew faster on external finance than internal finance as liberalization eases the allocation of capital and offers a higher marginal rate of return on capital with reduced credit constraints. Bhaduri (2000) observed that structural adjustments within the financial segment and widening & deepening of capital markets have presented firms in developing countries an opportunity to optimally decide their capital structure choices. Schmukler and Vesperoni (2001) argued that globalisation of the financial markets developed the financial system and improved transparency, market discipline, and financial infrastructure. This created new investment and financing opportunities for domestic firms.

These evidence suggest that the choice of capital structure has been affected by financial liberalization. These events/ crisis segregate the factors correlated with leverage on the basis of size of a firm, age of a firm, profitability, NDTS, tangibility as main characteristics that may affect leverage as explained by Bhaduri (2000) ; Eriotis, Vasiliou, and Ventoura- Neokosmidi (2007) ; Rajan and Zingales (1995) ; and Song (2005) in their studies. Feng and Ma (2013) found a significantly negative relationship between capital structure and firms' performance in listed Swedish firms under the recent global financial crisis. Goyal (2009) stated the relationship between leverage and following factors as median industry leverage (+ effect on leverage), market-to-book ratio (-), tangibility (+), profits (-), log of assets (+), and expected inflation (+). The industry subsumes a number of smaller effects on a firm's capital structure. Pandey (2001) suggested that debt ratios for Malaysian capital markets (both to book values and market values) showed that profitability, size, growth, risk, and tangibility variables had a significant influence. Amsaveni and Gomathi (2012) in their study stated that profitability, uniqueness, business

risk, and liquidity were negatively related to leverage ; while tangibility, growth, size, and NDTS exhibited a positive relationship with leverage. Hence, the results of the study were partially supportive of the pecking order and trade off theories.

The study by Kakani, Saha, and Reddy (2002) concluded that size of a firm, marketing expenses, and international diversification had a positive relation with a firm's (listed on NSE or BSE from 1992-2000) market valuation. Maghyereh (2004) analysed that Jordanian firms had target leverage ratios and after the financial liberalization, their speed of adjustment to these ratios (debt - equity ratio) unexpectedly decreased. Khare and Rizvi (2011) showed that ROA was the most important factor for leverage followed by net profit margin and ratio of depreciation to total assets. The pecking order theory was found to be applicable for capital structure of BSE-100 index listed firms. Datta and Agarwal (2009) in the study suggested that the capital structure pattern on an average signified well for long term development of the Indian corporate sector. This gives a redeeming signal about the Indian corporate behaviour which shows more dependence on their internal funds than on external sources of finance. This supports the pecking order theory.

Research Design and Choice of Variables

This section defines the research design and choice of various dependent and explanatory variables for the study with their rationale. The capital structure for firms post financial liberalization changed magnificently. The capital structure of a firm comprises of debt (long term debt) and equity. As per empirical theories and work in the field of capital structure, the appropriate mix of debt and equity in a capital structure maximizes its value. The composition of capital structure is explained in terms of book value and market value. In terms of book value in the study, various relative financial leverage measures have been undertaken such as EBITDA to interest expense, long term debt to total assets, and equity to total assets. The dependent variables have been transformed into natural logarithm to overcome non- linearity problem with the data. Many studies focus on a single measure of leverage. The advantages and disadvantages associated with choice of various dependent variables are explained in Table 1(a).

Table 1(a). Advantages and Disadvantages Associated with Dependent Variables

Leverage Measure	Advantages and Disadvantages
EBITDA to Interest Expense	+ Measure of the risk that equity holders will not be able to make fixed payments and will have to give up control.
	– Assumes that short-term liabilities like accounts payable and short-term debt will be rolled over. Very sensitive to income fluctuations.
Equity to Total Assets	+ It shows that how much assets of the firm are owned by investors. It also inversely shows many assets are financed by debt.
	– The higher ratio means high equity share capital resulting in loss of control of a firm.
Long Term Debt to Total Assets	+ Measures the long-term financial position of a company, including its ability to meet financial requirements for outstanding loans.
	– Fails to incorporate the fact that there are some assets that are offset by specific non - debt liabilities.

Note : Adapted from Rajan and Zingales (1995) [1] ; Appendix 1 provides the description of these variables.

[1] In addition to the leverage measures depicted in Table 1, there exist other leverage measures ; for instance, the ratio of total debt to equity, the ratio of only total debt to capital, EBIT to interest expense, and so on.

Choice of Explanatory Variables Used

(i) Size of a Firm : Size of a firm is positively related to a firm's capital structure. Larger firms can negotiate loans on favourable terms, as they can get a larger loan amount at lower interest rates. Drobertz (2006) in his study argued that large firms have an easy access to equity finance than small firms. The larger firms have fewer information asymmetries. So, size of a firm is negatively related to leverage. The natural logarithm of total sales was used as a proxy for size of a firm and found a positive relationship on a sample of emerging market economies (Booth, Aivazian, Demigruc - Kunt, & Maksimovic, 2001). Song (2005) also found a strong positive correlation between size and total leverage with natural logarithm of total sales as a proxy on a sample of Chinese firms.

Measure used: Natural logarithm of total sales.

(ii) Profitability : As per the trade off theory, a profitable firm should take more debt in order to take advantage of interest tax shields. So, more profitable firms will have higher debt ratios. Similarly, as per free cash flow theory, profitable firms will issue more debt in order to pay out bondholders their cash in the form of interest and principal repayments. On the contrary, as per the pecking order theory, the first preference for raising funds should be retained earnings followed by debt (secured and unsecured loan) and lastly equity. Myers and Majluf (1984) found a negative relationship between profitability and leverage. These studies used EBDIT to total assets as a proxy to measure profitability of firms. Bauer (2004) used the OLS to test the effect of profitability on leverage in Czech firms and concluded a negative relationship between profitability and leverage.

Measure used: EBDIT to total assets.

(iii) Tangibility : According to the pecking order theory, a firm prefers secured debt as compared to unsecured debt. Jensen and Meckling (1976) in their study stated the possibility of shifting risk by managers to risky ventures at the expense of bondholders. The agency costs of debt can be mitigated with a high collateral value. So, tangibility is positively related with leverage. Song (2005) measured a positive relationship between tangibility and leverage of a firm for Swedish firms. Harris and Raviv (1991) observed NDTS and firms' assets to be proxies for tangibility.

Measure used: Gross fixed assets to total assets.

(iv) Growth : Myers (2003) suggested that firms with high growth prospects will have less debt finance. This finding is in the line with the trade off theory because growth rate is non - collateralized. Al - Najjar (2011) stated a positive relationship between leverage and growth for Jordanian firms. Thus, concluding that growth firms prefer debt financing.

Measure used: Percentage growth rate in total assets.

(v) Ownership : Previous studies suggested that ownership structure has a significant effect on the desire for control, which in turn influences the capital structure of a firm. Agca and Mansi (2008) in their study suggested that a firm's capital structures with high promoter control are reluctant to debt finance. Berger and DeYoung (1997) in their research suggested that managerial entrenchments in U.S public corporations led to debt avoidance in the capital structure.

Measure used: Percentage share of an Indian promoter holding (IPH) and foreign promoter holding (FPH) in a firm.

(vi) Tax Rate : According to the trade off theory, an optimal level of debt in a firm is which maximizes the tax shield and minimizes the bankruptcy costs. So, the level till which the benefits of debt are more than its costs, the firm should employ debt. Mackie Mason (1990) suggested that new research work showed that the method for tax rate was to study incremental financing decisions using discrete choice analysis.

Measure used: Ratio of PBT minus PAT to EBT.

(vii) Volatility : Volatility means risk. So, risk is the probability for a firm to become bankrupt. Therefore, it is assumed that volatility is negatively related to debt level. This inverse relationship has been explained by the trade off theory. Baxter (1967) in his research suggested that firms operating in low risk industries would have more debt capacities than firms operating in high risk industries. Natural logarithm of ROA is used as a proxy to measure volatility.

Measure used: Natural logarithm of ROA.

(viii) Non Debt Tax Shield : The existence of non-debt tax shield such as depreciation, operating losses, and investment tax credits carried forward in a firm's financial statements reduces the firm's tax bill above the effective tax rate. DeAngelo and Masulis (1980) suggested that the tax advantages of debt are lower for those inherent with opportunities to avoid tax through other related non-debt tax shelters such as depreciation, investment tax credits, and tax loss carry forwards. It follows that inherent with higher non-debt tax shields are less likely to issue more debt. Therefore, an inverse relationship is expected between non-debt tax shields and leverage. This negative relationship has been explained by the trade off theory. However, Chang, Lee, and Lee (2009) confirmed a positive association between leverage and non-debt tax shields for listed non-financial corporations.

Measure used: Ratio of depreciation to gross fixed assets.

(ix) Net Exports : The firms which are export oriented are abided by the rules and regulations of EXIM. Puliani (2000) suggested that firms have an access to various credit facilities and benefits covered under the sections for exporting firms by The Income Tax Act, 1961.

Measure used: Ratio of total exports minus total imports to total sales.

(x) Age of a Firm : Many studies have suggested that age of a firm has an effect on its capital structure. Bhaduri (2005) suggested that mature firms are less information asymmetric since the outsider to a firm has more data on their creditworthiness compared to young firms. So, on the basis of literature, young, small, and non business affiliate firms have more information asymmetrical problems. Therefore, their cost of raising funds is higher to mature firms. However, post liberalization, this scenario should change due to government intervention for promoting priority sectors.

Measure used: Difference between year of incorporation and the year in which the firm exists in the sample.

(xi) Working Capital Ratio : Long term solvency position of a business group is an expression of how much liquid assets the firm currently has to build its business, fund its growth, and produce value. If a firm can get money to move faster around the cycle or reduce the amount of money tied up in the business, it will generate more cash. The faster a firm (or the industry in which it is working) expands, the more cash it will need for working capital and investment as stated by Martin, Petty, Scott Jr., and Keown (1991). The positive relationship of WCR with leverage has been explained by the trade off theory.

Measure used: Ratio of current assets minus current liabilities to total sales.

(xii) Marketing Expenditure : Marketing expenses allow a firm to create entry barriers for its competitors by building intangible assets (say, brands, trademarks, patents) leading to higher profitability for the firm (Aaker, 2001). This is particularly important in industries where manufacturing technology is mature and firms rely on creating these marketing assets to create entry barriers.

Measure used: Marketing expenses plus advertising expenses to total sales.

(xiii) Research and Development Expenditure : Eurostat (2009) indicated that research and development expenditure in European Union (EU) firms promotes the production of technology and creates innovative ideas. Firms with high research and development expenditure have more intangible assets and consequently have less debt. Moreover, as per the pecking order theory, research and development expenditure increase the financing deficit. So, research and development expenditures are prone to adverse asset selection problem resulting in higher debt.

Measure used: Research development expenditure to total sales.

(xiv) International Diversification : International diversification involves producing/procuring the same products (or services) but developing a wider geographical reach. Many authors (e.g., Slocum, 1997) stated that international diversification offers several advantages. First, it allows firms to take advantage of new market possibilities. Secondly, it allows firms to exploit their core competencies and distinctive capabilities across units in different international markets.

Measure used: Ratio of total exports plus total imports to total sales.

Research Objectives

The objectives of the study are :

- To identify the capital structure of firms in the post liberalization period.
- To investigate the determinants that affect the capital structure of a firm during the post liberalization period.
- To analyse the effect of financial liberalization on capital structure composition of firms.

Hypotheses of the Study

Based on the research objectives, the hypotheses formed for the study are :

- **H_0:** There is no impact of financial liberalization on capital structure composition.
- **H_1 :** There is an impact of financial liberalization on capital structure composition.

Research Methodology

This paper analyses the capital structure composition during the post liberalization period for a time series data. The time period of 14 years (from 2001/02 - 2014/15) has been studied for a data of 41 non financial firms listed on Nifty 50. Nifty is a composition of 50 well diversified firms representing 11 sectors ; hence, accurately reflecting an overall market financial condition. A financial firm is an enterprise such as a bank whose primary business and

function is to collect money from the public and invest it in financial assets and it does not deal with production of goods. Moreover, the financial services sector is one of the sensitive sectors.

A longer time span of study would make the firms' performance analysis more rigorous and precise. Initially, 15 explanatory variables such as age of a firm, size of a firm, volatility, profitability, tangibility, growth, foreign promoter ownership, Indian promoter ownership, WCR (working capital ratio), marketing expenditure, research and development expenditure, NDTS (non debt tax shield), tax rate, net exports, international diversification were taken together for three dependent variables namely EBITDA to interest expense, equity to total assets, and long term debt to total assets. However, in the multicollinearity test, high correlation is found among the explanatory variables, so stepwise regression is used to estimate the best fit results. The explanatory variable growth has been dropped from estimation due to high correlation and insignificant *t* - value. The dependent variables considered for financial leverage have been transformed into natural logarithm to overcome the non- linearity problem with the data. Hence, the analysis is done by using descriptive analysis, correlation, and stepwise regression technique. The technique of stepwise regression allows us to construct three different models for each dependent variable with a set of unique explanatory variables. These different models have been constructed to analyse a maximum number of significant factors that have an impact upon the capital structure composition of a firm in the post liberalization period.

↳ **Data Collection :** Data collected is secondary in nature. The data for firms' financial statements were collected from publicly available database PROWESS (an electronic database developed and maintained by Centre for Monitoring Indian Economy). The data collected were tabulated, analysed, and interpreted using SPSS 20 software.

Analysis and Results

The Table 1(b), Table 2, and Table 3 explain the descriptive statistics (mean, standard deviation, VIF, and partial correlation) for all the dependent financial leverage variables with their respective set of explanatory variables. The time period studied is from 2001/02-2014/15.

(1) Descriptive Statistics

(i) Multicollinearity : To check multicollinearity, the variance inflating factor (VIF) is calculated for each variable. From the VIF column (refer Tables 1(b), 2, and 3 for details), it can be observed that none of the variables has

Table 1(b). Descriptive Statistics for Dependent Variable ln(EBITDA to Interest Expense)

Variables	Mean	Std. Deviation	*N*	VIF	Partial Correlation
ln(EBITDA to Interest expense)	3.463	1.902	523		
Profitability	.199	.094	523	1.122	.286
Tangibility	.462	.251	523	1.308	-.094
Research & Development Expenditure	.011	.023	523	2.757	.213
NDTS	.075	.043	523	1.185	.257
Foreign Ownership	9.33	18.892	523	1.076	.178
Size of a firm	11.392	1.540	523	1.115	-.157
Volatility	2.250	.899	523	2.822	.228

Note : VIF is variance inflation factor.

Table 2. Descriptive Statistics for Dependent Variable ln(Equity to Total Assets)

Variables	Mean	Std. Deviation	*N*	VIF	Partial Correlation
ln(Equity to Total Assets)	-3.889	1.033	543		
Tangibility	.457	.249	543	1.258	.268
Tax Rate	.230	.1390	543	1.159	-.169
Marketing Expenditure	.029	.0347	543	1.247	.315
Research & Development Expenditure	.011	.023	543	1.193	-.318
NDTS	.0769	.044	543	1.167	-.199
International Diversification	.906	10.872	543	1.114	-.120
Indian Promoter Ownership	40.81	27.351	543	1.091	.373
Size of a firm	11.357	1.596	543	1.244	-.515

Note : VIF is variance inflation factor.

Table 3. Descriptive Statistics for Dependent Variable ln(Long Term Debt to Total Assets)

Variables	Mean	Std. Deviation	*N*	VIF	Partial Correlation
ln(Long Term Debt to Total Assets)	-2.727	1.921	484		
Age of a firm	42.58	25.975	484	1.080	-.114
Profitability	.191	.0867	484	1.151	-.407
Tangibility	.470	.244	484	1.341	.153
WCR	.105	.153	484	1.224	-.198
NDTS	.073	.040	484	1.294	-.128
Net Exports	.001	.254	484	1.300	-.117

Note : VIF is variance inflation factor.

crossed the benchmark of 5-10. The benchmark set by Damodaran and Gujarati (2017) for VIF is 5-10, which states that if any variable has the VIF of 5-10, then a multicollinearity problem exists. But no multicollinearity problem is found in the study.

(ii) Partial Correlation : All the partial correlation values are less than .50 or negative (Damodaran & Gujarati, 2017), so it not a problem of multicollinearity (refer Table 1(b), Table 2, and Table 3 for details). Here after, we employ stepwise regression technique.

The number of observations is 523 for a time series data from 2001/02 - 2014/15. As indicated in Table 1(b), ln(EBITDA to interest expense) has a mean value of 3.463 with a standard deviation of 190.16%. It implies that the firms have EBITDA cushion of 346.3% against the interest expense. Profitability (measured by EBDIT to total assets) has a mean value of .199, indicating ROA of 19.9%. The mean value of volatility is 2.25 taken as natural logarithm of ROA. The tangibility has a mean value of .462, which indicates that gross fixed assets account for 46.2% of the total assets for the sample firms. The mean for size of a firm taken as natural logarithm of total sales has the highest value of 1.139 with standard deviation of 1.54 for sample firms.

The number of observations is 543 for a time series data from 2001/02 - 2014/15. As indicated in Table 2, ln(equity to total assets) has a mean value of -3.889 with a standard deviation of 1.033. It indicates that total assets are 388.9% of the equity level for the sample firms. NDTS has mean value of .0769 of gross fixed assets. The tangibility has a mean value of .457, which indicates that gross fixed assets account for 45.7% of the total assets for the sample firms. Marketing expenditure and research & development expenditure have mean values of .029 and

.011, respectively, indicating that marketing expenditure and research & development expenditure is 2.9% and 1.10% of the total sales. The mean for size of a firm taken as natural logarithm of total sales has the highest value of 1.136 with standard deviation of 1.596. For international diversification, the standard deviation is higher than its mean value. The mean value is .906, indicating that ratio of total exports and imports accounts for 90.6% of the total sales for sample firms.

The number of observations is 484 for a time series data from 2001/02 - 2014/15. As indicated in Table 3, ln(long term debt to total assets) has a mean value of -2.727 with a standard deviation of 1.92. It indicates that total assets are -272.7% of the long term debt for the sample firms. Profitability (measured by EBDIT to total assets) has a mean value of .191, indicating ROA of 19.1%. Tangibility has a mean value of .470, which indicates that gross fixed assets account for 47% of the total assets for the sample firms. NDTS has a mean value of .073, respectively of gross fixed assets. Working capital ratio and net exports have mean values of .105 and .01, indicating working capital and net exports at 10.5% and 1%, respectively of total sales for sample firms.

(2) Stepwise Regression Analysis : The stepwise regression has been designed to develop a regression model with a fewer number of explanatory variables and their maximum predictive accuracy. In stepwise regression, dependent variables for financial leverage are entered into the equation one at a time and each time, the weak dependent variable will be removed from the equation. Addition of independent variables for the respective model equations beyond this level makes the model unfit. Appendix Tables 1 to 3 in Appendix 1 explain the regression results for variables included in the study at the .05 level of significance.

Equation 1

$$ln(EBITDA\ to\ Interest\ Expense) = b_0 + b_1 Size + b_2 Volatility + b_3 NDTS + b_4 Profitability + b_5 Tangibility + b_6 R\&D\ Expenditure + b_7 Foreign\ Promoter\ Ownership + b_8 WCR + e$$

Equation 2

$$ln(Equity\ to\ Total\ Assets) = b_0 + b_1\ Size + b_2 Marketing\ Expenditure + b_3 NDTS + b_4 Tangibility + b_5 R\&D\ Expenditure + b_6\ Indian\ Promoter\ Ownership + b_7 International\ Diversification + b_8 Tax\ Rate + e$$

Equation 3

$$ln(Long\ Term\ Debt\ to\ Total\ Assets) = b_0 + b_1\ Age + b_2 Profitability + b_3 Tangibility + b_4 NDTS + b_5 WCR + b_6 Net\ Exports + e$$

The intercept of the equation is denoted by b_0. The regression coefficient *(b)* for the explanatory variables is mentioned in Appendix Table 1 (for equation 1), Appendix Table 2 (for equation 2), and Appendix Table 3 (for equation 3) in Appendix 1. Error term is denoted by *e*. Looking at the values of regression coefficients (refer Appendix Tables 1, 2, and 3 in Appendix 1), it can be seen that explanatory variables are significant. The below mentioned values of R^2 reflect the maximum predictive power and improvement in the overall model fit for given explanatory variables that are used to explain the dependent variable.

To check the presence of autocorrelation in the data, Durbin Watson (D - W) statistics is conducted. The D-W statistics show the serial correlation of residuals (first order) and range in value from 0 - 4, with an ideal value of 2 indicating that the errors are not correlated, although values near 1 to 2.25 are considered acceptable for a time series data as suggested by Montgomery (2001). The values in the study are .731, .782, and .776 for equation 1, equation 2, and equation 3, which are acceptable in relation to *F* test values for the sample firms.

Table 4. Stepwise Regression Results for Dependent Variable ln(EBITDA to Interest Expense)

R	R^2	Adjusted R^2	Std. Error	Durbin-Watson	*F*	Sig
.745	.555	.549	1.278	.731	80.274	.000

Note : Level of significance is .05

Table 5. Stepwise Regression Results for Dependent Variable ln(Equity to Total Assets)

R	R^2	Adjusted R^2	Std. Error	Durbin-Watson	*F*	Sig
.717	.514	.506	.726	.782	70.490	.000

Note : Level of significance is .05

Table 6. Stepwise Regression Results for Dependent Variable ln(Long Term Debt to Total Assets)

R	R^2	Adjusted R^2	Std. Error	Durbin-Watson	*F*	Sig
.588	.346	.338	1.56	.776	42.039	.000

Note : Level of significance is .05

The model includes volatility, NDTS, profitability, tangibility, research & development expenditure, foreign promoter ownership, and size of a firm as explanatory variables. In Table 4, the value of *R* is .745, reflecting the degree of association among these variables. The value of R^2 is .555, reflecting the percentage of total variation in ln(EBITDA to interest expense) explained by the regression model with a standard error of 1.278. The *F* test value (80.274) is statistically significant at the .05 level of significance. Profitability, foreign promoter ownership, size of a firm, and WCR share a positive relationship with financial leverage as explained by the trade off theory. Hence, the regression equation formed is :

ln(EBITDA to Interest Expense) = -1.398 + .558 *Volatility* + 8.504 *NDTS* + 6.725 *Profitability* + 13.88 *Research & Development Expenditure* + .013 *Foreign Promoter Ownership* + .134 *Size of a Firm* + .918 *WCR* - .556 *Tangibility*

The model includes size of a firm, tangibility, Indian promoter ownership, research & development expenditure, marketing expenditure, tax rate, and international diversification as explanatory variables. In Table 5, the value of *R* is .717, reflecting the degree of association among these variables. The value of R^2 is .514, reflecting the percentage of total variation in ln(equity to total assets) explained by the regression model with a standard error of .726. The *F* - test value (70.490) is statistically significant at the .05 level of significance. Tangibility and Indian ownership share a positive relationship with financial leverage as explained by the trade off theory. Size of a firm shares a negative relationship with financial leverage as explained by the pecking order theory. Hence, the regression equation formed is :

ln(Equity to Total Assets) = -.918 - .303 *Size of a Firm* + 1.035 *Tangibility* + .011 *Indian Promoter Ownership* - 13.938 *Research & Development Expenditure* + 8.959 *Marketing Expenditure* – 4.490 *NDTS* - .865 *Tax Rate* - .007 *International Diversification*

The model includes profitability, tangibility, WCR, NDTS, net exports, and age of a firm as explanatory variables. The value of *R* is .588, reflecting the degree of association among these variables. In Table 6, the value of R^2 is .346, reflecting the percentage of total variation in ln(LTD to total assets) explained by the regression model

with a standard error of 1.56. The *F* test value (42.039) is statistically significant at .05 level of significance. NDTS shares a negative relationship and tangibility shares a positive relationship with financial leverage as explained by the trade off theory. Profitability and WCR share a negative relationship with financial leverage as explained by the pecking order theory. Hence, the regression equation formed is :

ln(Long Term Debt to Total Assets) = -.673 – 8.560 *Profitability* – 1.141 *Tangibility* – 2.265 *WCR* – 5.676 *NDTS* -.818 *Net Exports* - .007 *Age of a Firm*

Conclusion and Implications

This paper aims to analyse the impact of financial liberalization on capital structure composition for 41 non - financial firms listed on Nifty 50 of NSE. After empirical testing the results for all three models, it can be concluded that all the explanatory variables studied are statistically significant with leverage. Hence, the null hypothesis is rejected. It shows that there is an impact of financial liberalization on capital structure composition.

ln(EBITDA to interest expense) explains the maximum variation in the capital structure composition after liberalization with maximum R^2 (55.5%) predictability followed by ln(equity to total assets) at R^2 value of 51.4%. The findings for ln(EBITDA to interest expense) show that size of a firm, age of a firm, NDTS, profitability, research & development expenditure, foreign promoter ownership, and volatility are positively related with leverage. This shows that these factors significantly affect the leverage of a firm. However, tangibility is negatively related with leverage. This shows that tangibility does not affect the leverage decision of a firm. The findings for ln(long term debt to total assets) do not explain a significant (R^2 is 34.6%) relation between capital structure composition and firms' performance.

The findings for ln(equity to total assets) and ln(long term debt to total assets) are consistent with the results obtained by Amsaveni and Gomathi (2012), Rajan and Zingales (1995), and Titman and Wessels (1988), which shows that age of a firm, profitability, WCR, NDTS, and tax rate are negatively related and tangibility is positively related with leverage. The study also indicates that for pre and post liberalization, the main factors affecting the capital structure at the firm level remains the same. Inclusion of determinants like international diversification and net exports in the post liberalization period offers various advantages. It allows access to new market opportunities with long term strategic competitiveness and firms have increased access to markets with lesser cost of capital. These determinants are negatively related with leverage in the study.

Limitations of the Study and Scope for Further Research

The limitation of the study is that the number of firms studied here are 41 only. So, the study can be further extended to a larger sample size with more explanatory variables like industry effects, inflation, etc., which were unfit for the present study. Future studies can be conducted by dividing the time period into various business cycle phases to ascertain the effect of global economic slowdown on capital structure composition.

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Appendix 1. Description of Leverage Measures

- **EBITDA to Interest Expense** is the ratio of earnings before interest, taxes, depreciation, and amortization to interest expense.
- **Equity to Total Assets** is the ratio of equity (equity share capital + reserves & surplus) to total assets (current assets + fixed assets).
- **Long Term Debt to Total Assets** is the ratio of long term debt (loan repayable in more than one year + convertible loan + leasing finance) to total debt (current assets + fixed assets).

Appendix Table 1. Stepwise Regression Results for Dependent Variable ln(EBITDA to Interest Expense)

Variables	Unstandardized Coefficients		Standardized Coefficients	*t*	Sig.
	B	Std. Error	Beta		
(Constant)	-1.398	.461		-3.034	.003
Volatility	.558	.105	.264	5.314	.000
NDTS	8.504	1.411	.193	6.026	.000
Profitability	6.725	.993	.331	6.773	.000
Research & Development Expenses	13.881	2.813	.168	4.934	.000
Foreign Promoter Ownership	.013	.003	.125	4.095	.000
Size of a firm	.134	.038	.108	3.485	.001
WCR	.918	.420	.076	2.184	.029
Tangibility	-.556	.261	-.074	-2.135	.033

Note : Level of significance is .05

Appendix Table 2. Stepwise Regression Results for Dependent Variable ln(Equity to Total Assets)

Variables	Unstandardized Coefficients		Standardized Coefficients	*t*	Sig.
	B	Std. Error	Beta		
(Constant)	-.918	.274		-3.347	.001
Size of a firm	-.303	.022	-.469	-13.90	.000
Tangibility	1.035	.140	.250	7.374	.000
Indian Promoter Ownership	.011	.001	.289	9.161	.000
Research and Development Expenses	-13.938	1.501	-.306	-9.284	.000
Marketing Expense	8.959	1.005	.300	8.918	.000
NDTS	-4.490	.769	-.190	-5.840	.000
Tax rate	-.865	.242	-.116	-3.581	.000
International Diversification	-.007	.003	-.069	-2.169	.031

Note : Level of significance is .05

Appendix Table 3. Stepwise Regression Results for Dependent Variable ln(Long Term Debt to Total Assets)

Variables	Unstandardized Coefficients		Standardized Coefficients	*t*	Sig.
	B	Std. Error	Beta		
(Constant)	-.673	.324		-2.073	.039
Profitability	-8.560	.880	-.386	-9.723	.000
Tangibility	1.141	.337	.145	3.382	.001
WCR	-2.265	.514	-.180	-4.402	.000
NDTS	-5.676	2.008	-.119	-2.827	.005
Net Exports	-.818	.319	-.108	-2.565	.011
Age of a firm	-.007	.003	-.096	-2.506	.013

Note : Level of significance is .05

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