
A Study on Determining Capital Structure Essentials in Listed Public Sector Companies While Raising Short Term Debt

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Abstract

The paper studies the impact of ten variables while raising short term debt in public sector companies in India. Existing research on capital structure has been confined to developed economies. The Indian Financial Market has been growing at an exponential rate even though encountering two recessions during the study period. The paper utilizes a larger data set in comparison to the earlier studies in India and examines additional factors. This study presents empirical evidence on the determinants of the capital structures with data from NSE Listed Companies. The study period in the study is from 2001 – 2010 with a sample size of 61 companies. The objective of the paper is to identify the factors which help while raising long term debt of public sector companies in India using Regression Modeling. The empirical results imply that Cost of Debt has a significant impact while raising short term debt of Public Sector Companies in India.

Keywords: Capital Structure, Public Sector Companies, Leverage, Corporate Finance, India

JEL Classification: JEL G32.

Introduction: Companies have been struggling with the wrong capital structures over four decades. During credit expansions, companies have time and again failed to build enough of liquidity to survive the contractions especially those enterprises which have an unpredictable cash flow streams which end up with excess debt during business slowdowns. Achieving the right capital structure by defining the composition of debt and equity for an organization to finance its operations and investments has challenged academics and practitioners alike. Some focus on the traditional tax benefit of debt, since interest is often a tax deductible expense. While many companies are holding substantial amounts of cash and discussing on what to do with it, the choice of capital structure for firms is by and large the most fundamental issue of the financial framework of a business entity

The researcher has examined 61 Government Companies and tested a range of hypotheses to determine which factors affect the capital structure decisions while raising long term debt. Due to the uniqueness of India as a country, it is essential to understand the behaviour of firms in the Indian economy individually. The maturity of the Indian markets is the motivation to study the determinants of capital structure for Indian firms.

Literature Review: The illusive search for optimal capital structure under the static model motivated more recent studies to focus on the long-term behavior of debt ratio (Baker and Wurgler (2002), Welch (2004) and Kayhan and Titman (2007)). Trade-off theory posits that since managers strive to rebalance away short-term deviations from the optimal leverage ratio, no factor has

persistent long-term effect on debt ratios. Frank and Goyal (2009) report that one lagged profits become less important in determining the current leverage after 1980.

Consistent support for trade-off theory draws from the positive effect of size and value of assets on leverage ratio (Chang and Dasgupta (2009)). Corroborative support derives from the evidence that firm's debt-equity choice is influenced by deviations from long-term target leverage (Opler and Titman (2001))

Rao and Lukose (2001) in their study comparative analysis of pre-and post liberalization period revealed that size and risk measures were additional factors which influenced capital structure decisions.

Gurcharan (2010) finding showed that higher profitable firms use less debt to finance their investment. For the growth opportunities, a negative relationship with leverage is found signalling agency costs theory. Firm size had ambiguous relationship with leverage.

Ba-Abbad and Ahmad Zaluki (2012) revealed that company size and profitability had dominant roles in explaining the variation in the total debt ratios. Kouki and Said (2012) concluded that determinants of financial structure were classified as follows: firms adjust their debt levels based on a target ratio explained by several variables: firm size, profitability, growth opportunities and non debt tax shield. Ramjee and Gwatidzo (2012) found that asset tangibility, growth, size and risk were positively related to leverage, while profitability and tax were negatively related to leverage. Owolabi and Inyang (2012) revealed that for non-financial firms, there is a

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significant positive relationship between asset structure (tangibility) and long-term debt ratios. The size of the company was also found to have a statistically significant positive relationship with both total debt and short term debt ratios. Profitability had positive impact on leverage.

Baker and Wurgler's paper (2002) refocused the capital structure literature in two directions. It formally established the impact of equity market valuation on firms' debt-equity choice, and confirmed the anecdotal evidence that managers time equity issues to exploit high market valuations. Following the Baker and Wurgler study, several authors including Welch (2004), and Kayhan and Titman (2007)) have used the partial adjustment model to find that fluctuations in market-to-book ratios, cash flows, investment opportunities, and stock returns lead to significant deviations from the target leverage ratio, and capital structures move back to the target level albeit at a slow rate. Kayhan and Titman (2007) present that in market leverage regressions, the effect of profitability is positive, contrary to the notion that profitable firms use less debt.

Hovakimian and Li (2012), during the passive periods, changes in capital structure are induced only by changes in profitability with no adjustment, whereas during active financing periods, speed of adjustment is as high as one. Lemmon, Roberts and Zender (2008) report that variations in capital structure are primarily driven by factors that remain stable for long periods of time, although a transitory component makes some secondary contributions to the evolution of capital structure.

Research Methodology:

Objective: To understand the impact of each independent variable while raising long term debt for public sector companies

Data Source: The sample contains cross-sectional data for public sector companies listed on the National Stock Exchange. This study used accounting data. The source for entire data is *Prowess* (electronic data base developed and maintained by Centre for Monitoring Indian Economy). The data covers period from 2001 to 2010. It comprises of 61 Companies selected on the basis of availability of complete record of the variables. Data collected for the software was tabulated, analyzed, and interpreted using SPSS (Statistical Package for Social Sciences).

Research Methodology: Multiple regression analysis has been used with satisfying all its five assumptions i.e. The Normality Assumption Test, The Homoscedasticity Assumption Test, The Linearity Assumption Test of each of the Independent Variables with the Dependent Variable, The Durbin-Watson d Statistic Test for Detecting Serial Correlation and The Multicollinearity

Test in trying to understand the significant and the insignificant variables.

Explanatory Variables

Dependent Variables

Long Term Debt Ratio (LTDR): Long term debt ratio is computed as **Long Term Debt / Total Assets**.

Independent Variables

Profitability (PROF): Operating profit rate of return (**EBIT/ Total Assets**) is used as a measure of profitability.

Growth (GROW): The growth factor is measured by the **percentage change of assets**.

Assets Tangibility (TAN): The formula used is the **ratio of net fixed assets to total assets**.

Size (SIZE): The measure used in this study is the **natural logarithm of its total assets**.

Cost of Debt (COD): The measure of Cost of Debt in the study is using **Interest before Tax/ Long Term Debt**.

Liquidity (LIQ): It is calculated by **dividing the total current assets over the total current liabilities**.

Financial Distress (FINDIST): **Volatility (standard deviation) of firm's cash flow** is used as proxy for the observable firm's risk and the probability of financial distress.

Tax Rate (TAXR): Tax rate is measured for each company by dividing its **tax provision by profit before tax**.

Debt Serving Capacity (DSC): The study proxies for debt with the ratio between **profit before depreciation, interest and taxes to total interest**.

Age (AGE): The dummy variable takes the **value one if the firm is below the age of 20 years and zero otherwise**.

Results: Results for regression analysis of public sector companies in India is given in Table 1 below

Table 1: Results of Regression Analysis for Public Sector Companies in India

Public Sector Companies		Public Sector Companies	
Short Term Debt Ratio		Short Term Debt Ratio	
(Constant)	0.774 (0.290)	LIQ	0.633 (0.482)
PROF	0.307 (-1.038)	FINDIST	0.873 (-0.161)
GROW	0.936 (0.081)	TAXR	0.556 (0.595)
TAN	0.217 (1.259)	DSC	0.492 (-0.695)
SIZE	0.055 (-1.994)	AGE	0.702 (0.386)
COD	0.012* (-2.663)	R ²	0.592

Values in the parentheses represent t-statistics adjusted using the procedures of White (1980). Significance at 5% level is indicated by one asterisk

Table 2

Objectives		Null Hypotheses	
(1)	To study and analyze the determinants of capital structure of Public Companies by investigating the impact of Profitability on Short Term Debt	H ₀₁	There is no significant impact of Profitability of public sector companies on Short Term Debt
(2)	To study and analyze the determinants of capital structure of Public Companies by investigating the impact of Growth on Short Term Debt	H ₀₂	There is no significant impact of Growth of public sector companies on Short Term Debt
(3)	To study and analyze the determinants of capital structure of Public Companies by investigating the impact of Asset Tangibility on Short Term Debt	H ₀₃	There is no significant impact of Asset Tangibility of public sector companies on Short Term Debt
(4)	To study and analyze the determinants of capital structure of Public Companies by investigating the impact of Size on Short Term Debt	H ₀₄	There is no significant impact of Size of public sector companies on Short Term Debt
(5)	To study and analyze the determinants of capital structure of Public Companies by investigating the impact of Cost of Debt on Short Term Debt	H ₀₅	There is no significant impact of Cost of Debt of public sector companies on Short Term Debt
(6)	To study and analyze the determinants of capital structure of Public Companies by investigating the impact of Liquidity on Short Term Debt	H ₀₆	There is no significant impact of Liquidity of public sector companies on Short Term Debt
(7)	To study and analyze the determinants of capital structure of Public Companies by investigating the impact of Financial Distress on Short Term Debt	H ₀₇	There is no significant impact of Financial Distress of public sector companies on Short Term Debt
(8)	To study and analyze the determinants of capital structure of Public Companies by investigating the impact of Tax Rate on Short Term Debt	H ₀₈	There is no significant impact of Tax Rate of public sector companies on Short Term Debt
(9)	To study and analyze the determinants of capital structure of Public Companies by investigating the impact of Debt Serving Capacity on Short Term Debt	H ₀₉	There is no significant impact of Debt Serving Capacity of public sector companies on Short Term Debt
(10)	To study and analyze the determinants of capital structure of Public Companies by investigating the impact of Age on Short Term Debt	H ₀₁₀	There is no significant impact of Age of public sector companies on Short Term Debt

Primary Data

The results of the ten independent variables are given in the table 3 below.

Table 3: Coefficients and 't' value of the ten independent variables of Model 2

Independent Variables	Un Standardized Coefficients		Standardized Coefficients	t	Sig	Null Hypothesis Results
	B	Std. Error	Beta			
(Constant)	.636	2.192		.290	.774	
PROF	-8.537	8.222	-.232	-1.038	.307	Not Rejected
GROW	.447	5.535	.014	.081	.936	Not Rejected
TAN	2.206	1.752	.206	1.259	.217	Not Rejected
SIZE	-.494	.248	-.370	-1.994	.055	Not Rejected
COD	-1.028	.386	-.432	-2.663	.012	Rejected
LIQ	.023	.048	.075	.482	.633	Not Rejected
FINDIST	-.008	.048	-.020	-.161	.873	Not Rejected
TAXR	2.140	3.596	.104	.595	.556	Not Rejected
DSC	-.007	.010	-.118	-.695	.492	Not Rejected
AGE	.557	1.442	.063	.386	.702	Not Rejected

a. Dependent Variable: logSTDR

Primary data

- Results for objective number 1:** From the table above, it can be observed that “t” value for 'Profitability' is -1.038 which is not significant. Therefore, the null hypothesis H_{01} is not rejected and hence it can be concluded that Profitability did not produce significant impact on Short Term Debt.
- Results for objective number 2:** From the table above, it can be observed that “t” value for 'Growth' is 0.081 which is not significant. Therefore, the null hypothesis H_{02} is not rejected and hence it can be concluded that Growth did not produce significant impact on Short Term Debt.
- Results for objective number 3:** From the table above, it can be observed that “t” value for 'Asset Tangibility' is 1.259 which is not significant. Therefore, the null hypothesis H_{03} is not rejected and hence it can be concluded that Asset Tangibility did not produce significant impact on Short Term Debt.
- Results for objective number 4:** From the table above, it can be observed that “t” value for 'Size' is -1.994 which is not significant. Therefore, the null hypothesis H_{04} is not rejected and hence it can be concluded that 'Size' did not produce significant impact on Short Term Debt.
- Results for objective number 5:** From the table above, it can be observed that “t” value for 'Cost of Debt' is -2.663 which is significant at 0.05 level.

Therefore, the null hypothesis H_{05} is rejected and hence it can be concluded that Cost of Debt produced significant impact on Short Term Debt.

- Results for objective number 6:** From the table above, it can be observed that “t” value for 'Liquidity' is 0.482 which is not significant. Therefore, the null hypothesis H_{06} is not rejected and hence it can be concluded that Liquidity did not produce significant impact on Short Term Debt.
- Results for objective number 7:** From the table above, it can be observed that “t” value for 'Financial Distress' is -0.161 which is not significant. Therefore, the null hypothesis H_{07} is not rejected and hence it can be concluded that 'Financial Distress' did not produce significant impact on Short Term Debt.
- Results for objective number 8:** From the table above, it can be observed that “t” value for 'Tax Rate' is 0.595 which is not significant. Therefore, the null hypothesis H_{08} is not rejected and hence it can be concluded that 'Tax Rate' did not produce significant impact on Short Term Debt.
- Results for objective number 9:** From the table above, it can be observed that “t” value for 'Debt Serving Capacity' is -0.695 which is not significant. Therefore, the null hypothesis H_{09} is not rejected and hence it can be concluded that 'Debt Serving Capacity' did not produce significant impact on Short Term Debt.

10. Results for objective number 10: From the table above, it can be observed that “t” value for 'Age' is 0.386 which is not significant. Therefore, the null hypothesis H_{010} is not rejected and hence it can be concluded that 'Age' did not produce significant impact on Short Term Debt.

Conclusion: Hypotheses based on comparing the relationships between long term debt and ten explanatory variables that represent profitability, growth, asset tangibility, size, cost of debt, liquidity, financial distress, tax rate debt serving capacity and age were developed to test which independent variable best explained Indian Public Sector Companies' capital structure.

The empirical results imply that Cost of Debt has a significant impact while raising short term debt of Public Sector Companies in India.

Major observations from the study have been such that while determining capital structure, public sector companies lay much emphasis on factors like their size in terms of their asset, age, interest rates at which debt is availed and their capacity to service that debt. This finding indicates that although public sector companies have access to both equity and debt markets, but while raising debt by issuing bonds such as Government Guaranteed Bonds, Debentures, PSU Bonds, Commercial papers etc., cost of capital has a significant impact. State owned companies raised over Rs. 56,000 cr from debt and money market during 2010-11 which was an increase of around 26 percent over its previous year. NTPC and Power Grid issued bonds and debentures of over Rs.20, 232 cr in 2010-11 as against Rs. 14,500 cr its previous year. Oil sector PSUs including BPCL, GAIL, HPCL and IOC collectively raised Rs. 6,000 crore during the fiscal, a rise from less than Rs 2,000 crore in 2009-10. As far as other major sectors such as, Bharat Sanchar Nigam Limited (BSNL), it raised about Rs. 10,000 crore and the aviation sector PSUs, the National Airports Authority of India Rs. 1,600 crore. Such debt can only be catered to by companies which have been existing for decades and only such companies can bare the interest burden that follows with it. Also, while determining price of the bond in the debt market, apart from factors such as economic conditions and the market scenario, including state of money supply in the economy, factors such as interest rates prevalent in the market and the rates of new issues, future interest rate expectations and credit quality of the issuer also play a significant role. So again for factors like these, determinants such as interest rates have a crucial role while determining capital structure of public sector companies.

This study distinguishes itself from previous papers with the introduction of key variables that have not been studied in previous papers. The study also contains a

significantly larger data set than previous papers. The paper is a major contribution to the capital structure literature due to its large number of observations in comparison to previous studies.

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