

## Determinants of Capital Structure – A Study of Manufacturing Sector PSUs in India

Chandra Sekhar Mishra<sup>1+</sup>

<sup>1</sup> Assistant Professor

Vinod Gupta School of Management

IIT Kharagpur

**Abstract.** This study seeks to identify the determinants of Indian central PSUs' capital structure. This is important since one does not come across many studies related to the PSUs. Moreover in the post disinvestment phase, the PSUs in India have become more market oriented in terms of raising funds. The gradual reduction in the budgetary resources for the PSUs is also one of the reasons. The PSUs have got to depend more on extra-budgetary resources (EBRs) for their needs. PSUs are also different in several ways than their counterparts in the private sector. For this study a sample of 48 profit making manufacturing PSUs is considered for the time period 200603 to 201003. Multiple regression has been used to find out the factors affecting capital structure. The independent variables have been considered keeping in view Agency Theory, Pecking Order Hypothesis and other established capital structure models. 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 (defined as growth in total assets) is positively related to leverage. As predicted by theory NFATA and ROA are respectively positively and negatively 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.

**Keywords:** Financing; Capital Structure; Public Sector Undertakings; Pecking Order Hypothesis;

### 1. Introduction

The corporate finance pattern is of vital importance for the financial well being of companies. Corporate finance decisions affect the various facets of the corporate management directly or indirectly, which ultimately determine the wealth of investors. The corporate finance decisions in Public Sector Undertakings affects not only the financial soundness of the concerned PE but also the financial health of the nation as a whole, since these are essentially public investment decisions of the government and a number of agencies of the Government are involved in this process. In India, the government set up PSUs as an instrument to remove regional disparities, eradicate unemployment problems, upliftment of backward areas, and backward classes. Moreover, in the years following independence, the private sector industrialists were not forthcoming to establish industries involving huge investments. As a result, government had to step in. since the dawn of independence on August 15, 1947, PSUs have acted as a major policy instrument in the transition of the country from a planned economy to a market economy. The various industrial and economic policies of the government have highlighted the role of public sector in the economic development and it was clear from pre 1991 policies that had a pro public sector approach all these days.

In the changed circumstances, the PSUs while being appreciated for their contribution in providing large-scale employment, and industrial development, are also being criticized for their financial performance in terms of return earned on the public money invested therein. Due to other compelling reasons then and dismal performance of PSUs in some of the areas, the government had to rethink and formulate a new vibrant economic policy in 1991, which marked the beginning of liberalization process in India. Post 1991,

---

+ Corresponding author

the financing environment of PSUs has experienced a lot of change. The PSUs have been required to access the market for further financing. Instead of extending budgetary support to the PSUs, the government has used the disinvestment route to augment its own resources. Successive governments irrespective of the party ideology of the ruling party or combination could not stop the disinvestment process. The disinvestment although has not resulted in large-scale privatization, has made the PSUs market savvy. It has opened the route for them to go for IPOs etc.

## 2. Capital Structure – Its meaning and Importance

For any organization financial strategy is of utmost importance. By financial strategy, one means the broad corporate financial decisions that are made by the corporates' management committee or above – i.e. at the level of Board. These are not specific decisions, such as the decision to undertake a project or not. It might even involve decision regarding the rate of interest at which funds need to be borrowed. Broadly, three kinds of policies come under the purview of financial strategy. They are capital structure policy, dividend policy and capital budgeting policy. All three policies are important in their own way and are interlinked. Ignoring any of them in corporate financing decision-making is very difficult. Capital structure policy is normally concerned about:

- The proportion of debt and equity to finance the company's operations
- How does the long term to short-term debt mix look like?
- In case equity finance is to be raised, should it be through a rights issue or primary issue?
- To what extent should internal funds be used to finance the company's various activities? It also examines, vis-à-vis, the extent to which the external funds can be used to carry out the same activities.

The capital structure of financing pattern decision is a significant managerial decision. It influences shareholders' wealth. As a result, the market value of the share may be affected by the capital structure decision. The capital structure decision is a continuous process. The shape of the same changes from what it was at the inception to what it is at the time of expanding the business. Any change in the capital structure pattern affects the debt-equity mix, which in turn influences the cost of capital. Consequently this affects the value of the firm. Similarly, capital structure policy and dividend policy are interrelated. Dividend policy affects the profits available for reinvestment. Retention of profits for reinvestment strengthens the shareholders' equity position. In a nutshell, we can say that capital structure has a bearing on the cost of capital, net profit, earnings per share, dividend payout ratio and liquidity position of the firm. These variables, coupled with others, determine the value of a firm.

Capital Structure Puzzle: Do changes in capital structure affect the value of a firm? This question has been puzzling the minds of both finance managers and academicians for the last 40 years, especially after publication of the path-breaking article by Franco Modigliani and Merton Miller. In a perfect capital market, their irrelevance model is absolutely valid and is supported by all, but in the case of an imperfect market the views differ greatly and, as a result, till date no universally accepted model has been developed on this crucial issue.

## 3. Determinants of Capital Structure – Theoretical Aspects

Corporate finance literature has focused on two broad categories of explanation for capital structure viz., 1) agency theoretic explanations that stress conflict of interest between stakeholders in the firms; and 2) explanations that stress tax consequences of capital structure choices. There are also other theories of capital structure suggested by various authors in their respective studies. The following table summarizes the determinants of capital structure as per various known/ unknown theories.

Table 1: Determinants of Capital Structure – What Theories Say?

Variable	Measure	Theory	Expected Sign
Asset Tangibility	NFATA	Information Asymmetry	+ve
Growth	% Change in Sales or CAGR in Sales	Agency	-ve
Size	Log of Sales or Total Assets	Information Asymmetry	+ve

Earnings Volatility	Variation in operating income	Not Specific	-ve
Profitability	Return on Assets	Pecking Order Hypothesis; Information Asymmetry	-ve +ve
Non Debt Tax Shield	Deprecation to Total Assets	Not Specific	-ve
Tax	1 – [Earnings after Tax/ Earnings before Tax]	Not Specific	+ve
Age	Age since Incorporation	Information Asymmetry	+ve
Uniqueness	Research & Development Expense to Sales or Selling and Advertisement Expense to Sales	Product/ Input Market	-ve

Source: Compiled from various studies

#### 4. ABC of PSU Financing in India:

In the context of PSU financing in India, what is known as ‘ABC’ trend is observed. ‘A’ stands for assistance. During the initial setting up of PSUs in India, the government supplied funds in the form of equity to these units arbitrarily; i.e. as and when necessary without considering the end use of such funds. Then came budgetary allocation i.e. ‘B’ when some accountability was imposed on the Government as provisions were made for PSUs in the nation’s annual budgets. As such, Parliament was entrusted with the task. The budgetary support or allocation to PSUs remained the major source of financing till 1985, when the government permitted PSUs to tap the market through bonds – C. Now one finds PSUs tapping equity both in the domestic and international markets – ‘C’ in the trend.

#### 5. Sample, Data and Variables Considered for the Present Study:

Only profit making manufacturing central public sector enterprises have been considered for this study. This list of 41 PSUs include both listed and unlisted companies. Hence some of the variables that requires the company’s market value of share have not been considered. Out of all the listed PSUs, in several of them regular trading does not take place. Table – 2 provides the list of variables and the explanation of the same that are considered for the present study. All the variables have been averaged over a period of five years ending March 2010. The data have been collected from the Prowess database of CMIE. Stepwise regression has been used to find the factors affecting the capital structure.

Table – 2: Variables and their Definition

Variable	Explanatory Definition	Variable	Explanatory Definition
<b>TBTA</b>	Total debt to total assets	<b>NDTS</b>	Depreciation to Total Assets
<b>TBCE</b>	Total debt to Capital Employed (Total debt + Net worth)	<b>VOL1</b>	Coefficient of Variation of Return on Total Assets
<b>ROA</b>	Earnings before interest and taxes (EBIT) to Total assets	<b>VOL2</b>	Coefficient of Variation of Return on Sales
<b>SIZE</b>	Natural logarithm of Total Assets	<b>NFATA</b>	Net fixed assets to Total assets
<b>TAX</b>	1- (PBT/PAT) or Tax paid to PBT	<b>GROWTH</b>	CAGR of Total Assets between 200603 and 201003

#### 6. Findings and Analysis of Results:

Table – 3 provides the descriptive statistics of the variables considered in this study. It is revealed that PSUs borrow less. The average total debt to total borrowing varied between 0% and 68%. The regression was run for the measures of capital structure – TBTA and TBCE. Stepwise regression is applied to find out the impact of different variables on the debt ratio. Table 4a provides the result of regression without excluding any variable. Table 4b provides those variable which were ultimately found after elimination of other variables by using stepwise regression method.

Table – 3: Descriptive Statistics

Variable	N	Minimum	Maximum	Mean	Std. Deviation
----------	---	---------	---------	------	----------------

TBTA	48	.0000	.6800	.1586	.1892
TBCE	48	.0000	1.5320	.2374	.2882
ROA	48	.0300	.4860	.1365	.09191
SIZE	48	2.0846	11.8405	7.9227	2.5690
TAX	48	.0260	.5260	.2947	.1030
NDTS	48	.0000	.0580	.0215	.0134
NFATA	48	.0000	.8360	.3151	.2260
NPM	48	.0100	.6480	.1615	.1553
VOL1	48	.0000	.8640	.2867	.1806
VOL2	48	.0559	1.1456	.3591	.2603
GROWTH	48	.0142	.4656	.1690	.0973

### 6.1. Asset Structure as determinant of capital structure:

Agency theory suggests that firms with large fixed assets have a comparative advantage in obtaining long-term debt, whereas firms with high sales relative to fixed assets have a comparative advantage in borrowing over shorter periods. This suggests that NFATA is positively related to leverage. In the present study we find NFATA to be positively related with both the measures of leverage. However only in case of TBTA it is statistically significant.

### 6.2. Effect of PSUs' excess cash flow on capital structure:

In this study, we have used the return on assets (ROA) to measure the firm's ability to generate capital internally. As expected by theory, we find ROA to be negatively related to both the measures of leverage. It is implied that the profitable PSUs borrow less.

### 6.3. Taxation vs. Capital Structure :

Impact of tax effects on capital structure is measured through NDTS and TAX. There is no significant relationship between NDTS and any measure of leverage. Contradicting the theory, the tax and all measures of leverage are negatively related and the relationship is statistically significant. However the result is similar to that found in Booth et al (2001). This suggests that the managers of PSUs have no incentive to take the advantage of tax shield and go for proper leverage. They do not attach any importance to tax effects while deciding on capital structure. In this study, it is found that, leverage is positively related with growth. Possibly the lenders find comfortable lending to those PSUs which grow faster than others. Size is negatively related with leverage. This implies that size does not matter much for the PSUs to borrow. Else the growth in the assets is financed more by equity (internal as well as external).

Table 4a: Determinants of Capital Structure (Method: Enter)

$$\text{LEVERAGE (TBTA)} = \beta_1\text{ROA} + \beta_2\text{SIZE} + \beta_3\text{TAX} + \beta_4\text{NDTS} + \beta_5\text{NFATA} + \beta_6\text{NPM} + \beta_7\text{VOL1} + \beta_8\text{VOL2} + \beta_9\text{GROWTH}$$

	Constant	ROA	SIZE	TAX	NDTS	NFATA	NPM	VOL1	VOL2	GROWTH	R <sup>2</sup>	Adj. R <sup>2</sup>
Leverage: TBTA	.090	-.815 <sup>2</sup>	-.001	-.398	1.510	.383 <sup>2</sup>	.038	-.152	.172	.775	.529	.417 <sup>1</sup>
Leverage: TBCE	0.510	-1.105	-0.012	-0.994	2.762 <sup>2</sup>	0.281	-0.203	-0.126	0.085	0.945	.388	.243 <sup>2</sup>

<sup>1</sup>& <sup>2</sup> : Significant at 1% and 5% respectively.

Table 4b: Determinants of Capital Structure (Method: Stepwise)

	Constant	ROA	SIZE	TAX	NDTS	NFATA	NPM	VOL1	VOL2	GROWTH	R <sup>2</sup>	Adj. R <sup>2</sup>
Leverage: TBTA	0.025	0.995 <sup>2</sup>	*	*	*	0.502 <sup>1</sup>	*	*	*	0.657 <sup>2</sup>	.485	.450 <sup>1</sup>
Leverage: TBCE	0.663	-0.995 <sup>2</sup>	*	-0.983 <sup>2</sup>	*	*	*	*	*	*	.300	.269 <sup>1</sup>

<sup>1</sup>& <sup>2</sup> : Significant at 1% and 5% respectively.

\* Results are not significant and variables are excluded as a result of step-wise regression.

## 7. Conclusion:

The changing pattern in the financing is observed in case of the PSUs with reforms in the Indian economy and the public sector in particular accompanied by disinvestment. The PSUs have got the challenge to access the market for both equity and debt finance. The gradual reduction in the interference otherwise known as increasing autonomy to them will make this task easier. The PSUs have to relook at the financial leverage they have at present and change suitably. In this context the present study made one of the first attempts to know the factors that affect their capital structure. In confirmation with theory more specifically, pecking order hypothesis, the leverage is found to be negatively related to profitability, i.e. the PSUs use the internal accruals first for the needs of expansion. The tangibility measured by the ratio of net fixed assets to total assets is found to be positively related to leverage. In contrast with theory, the tax rate is negatively related to the leverage. However such result has also been found in Booth et al (2001). In that study in almost all the sample developing countries the tax rate is found to be negatively related to leverage. The present study is one of the limited studies based on sample of central PSUs in India. One can possibly enlarge the sample or modify the same by taking the PSUs listed to capture the effect of the market on the capital structure.

## 8. References

- [1] Allen D E (1991), The Determinants of the Capital Structure of Listed Australian Companies: The Financial Manager's Perspective, *Australian Journal of Management*, Vol. 16, No.2, December 1991, pp. 103-28.
- [2] Bancel Frank and Mittoo Usha R (2003), The Determinants of Capital Structure Choice: A Survey of European Firms, Paper presented at Sixty Third Annual Meeting of American Finance Association, Washington, DC. January 3-5.
- [3] Bhaduri, Soumitra N (2002), Determinants of Corporate Borrowing: Some Evidence from the Indian Corporate Structure, *Journal of Economics and Finance*, Vol. 26, No. 2, pp. 200-15
- [4] Booth, L., V. Aivazian, A. Kunt-Demirguc, and V. Maksimovic. 2001, Capital Structure in Developing Countries, *Journal of Finance* Vol. 56: 87-130.
- [5] De-Angelo, H and Masulis R (1980), Optimal Capital Structure under Corporate and Personal Taxation, *Journal of Financial Economics*, 8.
- [6] Demirguc-Kunt, A and Maksimovic, V (1994), Capital Structure in Developing Countries: Evidence from Ten Countries, *The World Bank Policy Research Working Paper No. 1320* (June).
- [7] Glickman M (1996), Modigliani and Miller on Capital Structure: A Post Keynesian Critique, UEL Department of Economics Working Paper, No. 8 December.
- [8] Green C J, Murinde V and Suppakitjarak J (2002), Corporate financial structures in India, Finance And Development Research Programme, Institute for Development Policy and Management, University of Manchester, Working Paper Series, Paper # 43, May 2002.
- [9] Harris, M and Raviv A (1991), The Theory of Capital Structure, *Journal of Finance*, 46, pp. 297-356.
- [10] Heshmati A, (2001), The Dynamics of Capital Structure: Evidence from Swedish Micro and Small Firms, *Research in Banking and Finance*, Volume 2, pages 199–241
- [11] Hovakimian A, Hovakimian G and Tehrajan H (2003), Determinants of Target Capital Structure: The Case of Dual Debt and Equity Issues, Paper presented at Sixty Third Annual Meeting of American Finance Association, Washington, DC. January 3-5
- [12] Huang Samule G H and Song Frank M (2002), The Determinants of Capital Structure: Evidence from China, Hong Kong Institute of Economics and Business Strategy, Working Paper No. 1042.
- [13] Maksimovic, V (1988), Capital Structure in Repeated Oligopolies, *Rand Journal of Economics*, 19, pp.389-408.
- [14] Maksimovic, V and Titman, S (1990), Financial Policy and Reputation for Product Quality, *Review of Financial Studies*, 4, pp.175-200.
- [15] Manos, R, Murinde, V and Green C J (2001), Business Groups and Capital Structure: Evidence on Indian Firms?, Finance And Development Research Programme, Institute for Development Policy and Management, University of Manchester, Working Paper Series, Paper # 34, December 2001

- [16] Mira FS (2002), On Capital Structure in The Small and Medium Enterprises: The Spanish Case, *Jurídicas Y De La Comunicación*, Universidad Cardenal Herrera- Ceu, Working Paper No. 2-2002
- [17] Modigliani, H and Miller, M H (1958), The Cost of Capital, Corporate Finance and the Theory of Investment, *American Economic Review*, Vol.48, No.3, pp.261-97\_ (1963), Corporate Income Taxes and Cost of Capital: A Correction, *American Economic Review*, Vol.53, No3, pp.433-43.
- [18] Myers, Stewart C. (1977), “Determinants of corporate borrowing”, *Journal of Financial Economics*, 5, 147–175.
- [19] Myers, S C (1984), The Capital Structure Puzzle, *Journal of Finance*, July, p.581.
- [20] Prasad S, Green C J and Murinde V (2001), Company Financing, Capital Structure, and Ownership: A Survey, and Implications for Developing Economies, Finance And Development Research Programme, Institute for Development Policy and Management, University of Manchester, Working Paper Series, Paper # 27, November, 2001.
- [21] Rajan, R., & Zingales, L. (1995). What Do We Know About Capital Structure? Some Evidence from International Data. *Journal of Finance*, 50(5), 1421–1460.
- [22] Titman, Sheridan and Roberto Wessels (1988), The determinants of capital structure choice, *The Journal of Finance*, 42, 1–19.