Dynamic Optimum Capital Structure Adjustment Model of BSE Listed Indian Manufacturing – A Case Study of Engineering Goods Industry

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Abstract

Capital structure is debated topic in modern financial management even after Modigliani and Miller's contribution to capital structure theory. The researchers are interested in various aspects of affecting capital structure and weather capital structure decision influences or not to market value of the business. Simply these approaches which are commonly known as relevant or irrelevant, researchers analyze how capital structure decision affect to market value of the business. The capital structure theories are built on theoretical models and these models helps to bridge the gap between theoretical and real-world phenomenon. Basically, these theoretical models can be statistical or mathematical approaches, the statistical approaches estimate the capital structure based on the past data with various company specific and macro-economic variables and mathematical approaches solve the capital structure decisions in the form mathematical equations. The capital structure research approaches depend upon the need of the study and purpose of the study to solve the underlying research question. In this study, a capital structure behavior of BSE listed companies of engineering goods is compared with consumer sector companies with statistical approaches for the study period 2007 and 2017.

Keywords: dynamic adjustment of capital structure, BSE, optimum capital structure, Arellano- Bond estimation.

Introduction:

The modern financial management have three critical areas which has significant bearings on shareholders wealth maximization and that includes investment decision, financing decision and dividend decision. These three decisions are interconnected and need to be analyzed with sophisticated techniques for long run success of business. The management as agent of owner's have fiduciary responsibility to discharge, the decisions and practice which enhances the shareholders wealth in the long run should be followed. In this study, dynamic capital structure adjustment model of trade off theory is examined in BSE listed engineering goods companies with the Arellano- Bond estimation method. The dynamic capital structure adjustment model is based on idea of trade off theory of capital structure, trade off theory proposes that capital structure has optimum level at which benefit of debt and cost of debt are balanced. The benefit of debt generates from interest tax shield and cost of debt is cost of financial distress, the balance of benefit and cost of debt is part of skill and experience of finance manager. Finance manager avoids risky capital structure but being conservative it results into reduction in reward for owners. As risk and reward goes in hand and hand, finance manager in setting capital structure should be not either over leveraged or under leveraged or simply it must be at or near optimum level.

This study delved into following sections, the first section introduces to the dynamic capital structure adjustment model, second section presents the literature review of capital structure theories, third sections provides research methodology and in last two sections presents data analysis, findings and conclusion of the study.

Literature review

Mark J. Flannery et.al. (2006) studied 12,919 USA non finance companies during 1965 and 2001, the findings of the study suggests that USA companies have target capital structure and USA non-financial companies. The USA companies close the gap between actual and optimum capita structure in 2.63 years with the speed of adjustment of 38%.

Zhaoxia XU (2007) examined USA companies for target capital structure and sample of the study includes companies who observed 20% or capital structure changes, the study found asymmetric capital structure adjustment among the companies with major increase and decrease in debt ratios.

Priyanka Singh et.al. (2008) examined capital structure adjustment in Indian industries (automobiles, drugs & pharmaceuticals, textile, polymers, electronics, health services, information technology, dairy, tea & coffee and electricity) during 1991 to 2007, the study found asymmetric capital structure adjustment. The study found highest speed of adjustment Indian IT industry and least speed of adjustment in electricity industry.

Sulagna Mukherjee et.al. (2010) studied capital structure adjustment in 891 Indian manufacturing companies for the period of 1994 to 2008, the study concludes the presence of target capital structure with varying speed of adjustment for difference measures of leverage.

Basudeb Guha (2002) analysed the dynamic capital structure adjustment in 697 Indian manufacturing companies during 1990 to 1998, the study found capital structure decision is influenced by size of company, asset structure, profitability, financial distress cost and study found 23% and 63% speed of adjustment for short term and long-term debt respectively.

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Biswajit Gose et.al. (2017) examined asymmetric nature of capital structure adjustment by classifying Indian companies in group affiliated and standalone companies, the study found standalone and group affiliated companies made 30% and 44% speed of adjustment respectively.

Research gap: -The capital structure studies examined the various aspects of financing decisions and contradictory testimony about financing behaviour exist in the literature. The lack of consensus about capital structure theory necessitates to investigate capital structure behaviour and capital structure studies with respect to optimum capital structure are very limited available in Indian context.

Research Methodology

The following section discusses the research methodology of the study, that includes data collection, period of the study, statistical of the study.

1) **Problem statement** –The balance of capital structure mix result into reduced cost of financing the operation and hence finance manager design the targeted capital structure to minimize overall cost of capital and enhance value of the company. The target capital structure does not remain static but it is dynamic in nature, target capital structure varies with firm specific and macroeconomic variables and in such scenarios adjustment in capital structure is like walking on tight rope for finance manager. If capital structure adjustments are dynamic in nature then how BSE listed Indian manufacturing companies adjust actual capital structure with respect to changes in optimum capital structure and for the same engineering goods companies are selected for the analysis.

2) **Objectives of the study-**
a) To compare the determinants of capital structure of BSE listed engineering goods companies with consumer sector companies
b) To find out capital structure adjustment after deviation from optimum level.

3) **Data collection** – The capital structure adjustment studies requires the accounting data and the same can be extracted from financial statements. The required data for the analysis is collected from financial statements provided by Capitaline data base for the period of 2007 to 2017. The sample of the study includes 149 companies from engineering goods companies and 98 companies from consumer sector BSE listed companies.

4) **Statistical technique-** The objective of the study is to find out the determinants of capital structure and to understand the capital structure adjustment and for the same Arellano- Bond estimation method of dynamic panel regression model is adopted, the dynamic panel regression model is as per below :-

$Debt\ to\ total\ capital_{i,t} = \beta_0 + \beta_1\ Lagged\ debt\ to\ total\ capital_{i,t} + \beta_2\ Tangibility_{i,t} + \beta_3\ Sales_{i,t} + \beta_4 operating\ profit + \beta_5\ Depreciation + \beta_6\ GDP\ growth_{i,t} + \beta_7\ Stock\ market\ development + \beta_8 Real\ interest\ rate + \varepsilon_{i,t}$

5) **Variables of the study**

Sr.no.	Variable	Operational definition
1	Debt to total capital	Long term debt to total capital
2	Tangibility	Fixed asset to total asset
3	Sales	Log of sales
4	Operating profit	Operating profit before tax to total asset
5	Depreciation	Depreciation to total asset
6	GDP growth	Growth in GDP
7	Stock market development	Log of BSE Sensex
8	Real interest rate	Interest rate excluding inflation

Table no1 – Operational definition of the variables used in the study

6) **Hypothesis of the study**

There is no relationship between debt to capital and lagged debt to total capital, tangibility, sales, profit before tax, depreciation, GDP growth, stock market development, real interest rate.

Data analysis, interpretation and findings of the study

In this study dynamic capital structure adjustment is compared between consumer sector and engineering goods companies listed in BSE with the objective to find out speed of adjustment of capital structure after deviation.

Determinants of capital in structure in consumer products sector and engineering goods sector companies
1st objectives of the study

To compare the determinants of capital structure of BSE listed engineering goods companies with consumer sector companies

Table no.02 provides the comparison of determinants of capital structure in consumer sector and engineering goods companies listed in BSE. The study found lagged debt to total capital, tangibility, sales, operating profit, GDP growth are found statistically determinants of capital structure. The study found lagged debt to capital, tangibility and depreciation as strong determinants of capital structure in engineering goods companies. The study found only lagged debt to capital and tangibility are common determinants in consumer sector and engineering goods sector companies.

Sr.no.	Variable	Consumer Sector	Engg. Goods sector

		Coefficient	P value	Coefficient	P value
1	Lagged Debt to total capital	0.41	**0.00**	0.44	**0.00**
2	Tangibility	0.11	**0.00**	0.08	**0.05**
3	Sales	-0.02	**0.01**	-0.005	0.58
4	Operating profit	0.08	**0.03**	0.031	0.15
5	Depreciation	0.19	0.45	0.47	**0.05**
6	Stock market development	-0.02	0.09	-0.006	0.62
7	Real interest rate	0.007	0.48	-0.001	0.19
8	GDP growth	0.007	**0.00**	0.001	0.39

Table no.2 – Determinants of capital structure in consumer sector and engineering goods sector companies

Note :- Level of significance 5%

2nd objective of the study

To find out capital structure adjustment after deviation from optimum level.

The key finding is that consumer sector and engineering goods sector companies have optimum capital structure have similar speed of adjustment towards the optimum level after the deviation. Table no.03 shows the speed of adjustment 0.41 and 0.44 for consumer sector and engineering goods sector companies respectively. It takes 1.69 and 1.78 years to close the gap between actual and optimum capital structure for consumer sector and engineering goods sector companies respectively.

The computation of speed adjustment is as follows: -

Variable	Consumer Sector	Engineering goods
Coefficient of lagged debt to total capital	0.41	0.44
Speed of adjustment = 1 – Coefficient of lag debt to total capital	0.59	0.56
Time required to close the gap between actual and optimum capital structure	**1.69 years**	**1.78 years**

Table no3 – Speed of adjustment calculation

Conclusion

The capital structure decision is highly debated subject in the empirical corporate finance, the subject remained indecisive to accept capital structure theory with universal acceptability. In this study capital structure of BSE listed consumer sector and engineering goods sector companies compared as per trade off theory which believe finance manager pursue optimum capital structure. The study adopted dynamic trade off theory model with debt to total capital as dependent variable and lagged debt to total capital, sales, tangibility, operating profit, depreciation, stock market development, real interest rate are used as independent variable respectively. The study found out of eight independent variables only lagged debt to total capital and tangibility are found statistically significant determinants of capital structure and this findings suggest that finance manager differs on various determinants of capital structure in both the industries. The speed of adjustment of capital structure found similar both the industries and consumer sector and engineering goods sector companies have 0.59 and 0.56 speed of adjustment respectively. The speed of adjustment is found high in both the industries and with this speed of adjustment consumer sector and engineering goods companies close the gap between actual and optimum capital structure in 1.69 years and 1.78 years respectively. The findings of the study conclude that finance manager in BSE listed companies from consumer sector and engineering goods companies set target or optimum capital structure and adjust capital structure quickly after deviation from optimum level.

References

1. Guha-Khasnobis, B.; Bhaduri, S. N.Determinants of Capital Structure in India (1990–1998): ADynamic Panel Data Approach. *J. Econ.Integr.***2002**, *17* (4), pp.no, 761–776.
2. Ghose, B.; Kabra, K. C. Dynamic Capital Structure Adjustments and Business Group Affiliations: Indian Evidence. *Bus.Perspect. Res.***2018**, 6 (1), pp.no.27-41.
3. Singh, P.; Kumar, B. Trade off Theory or Pecking Order Theory: What Explains the Behavior of the Indian Firms?*Electron.Copy*. http://ssrn.com/abstract=1263226 ,pp.no.1-60**2008**.
4. Mukherjee, S.; Mahakud, J. Growth Opportunity and Capital Structure Dynamics: Evidence from Indian Manufacturing Companies. *J. Manag.Res.***2010**, *10* (3), pp. no. 180-192.
5. Flannery M, Rangan K. Partial adjustment toward target capital structures. Journal of Financial Economics, 2006, 79, pp.no. 469–506
6. Zhaoxia XU. Do firms adjust toward a target leverage level?. Bank of Canada, Working paper No. 2007-50, ISSN 1701-9397, Retrieved from https://pdfs.semanticscholar.org/bc7a/c0001bbc243e83519f99057e61de23a71d69.pdf

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