Chapter 17
Rational Influence of Debt Structure Patterns on Sustainable Profitability: A Pragmatic Evidence from Tata Steel

T. K. Murugesan and S. Vidhya

Abstract The primary crux of this empirical study is to analyze the rational influence of debt structure patterns on the profitability position of Tata Steel. The financial data of Tata Steel were collected for the period of ten years, i.e., from 2013 to 2022. Three econometric models were developed by the researchers to analyze the influence of debt content patterns on the profitability position of the sample company. For measuring the profitability of the company, the financial indicator of ROTA was employed and STD to TA, LTD to TA and TD to TA were employed in this empirical study to identify the debt structure patterns of the company. To pragmatically analyze the cogent association between debt structure patterns and profitability position, three significant accounting models were developed and analyzed by using Ordinary Least Square (OLS) indicators. Since three accounting models clearly showed that the overall debt structure patterns have the substantial stimulus on the profitability position of Tata Steel. The best accounting model was also selected based upon the OLS indicators such as OLS AIC criterion, OLS SCH criterion and OLS HQ criterion.

Keywords Debt structure · Profitability · ROTA · STD to TA · LTD to TA and TD to TA · OLS estimators

17.1 Preamble

The debt structure patterns of the company depend on the major financing decisions of the company. Financial policy is an imperative verdict that every firm needs to make a point because it not only influences the firm's estimated cash flows but also the firm's profitability and liquidity position in the future and makes a clear-cut association between debt content and profitability position of the firm (Baker et al.

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A. Edward J. et al. (eds.), *Digital Transformation for Business Sustainability*,
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2011). There are many sources available for funding long-term capital expenditure projects (Gleason et al. 2000). The authors indicated that there are many advantages of raising funds using debt instruments because the company can enjoy tax deductibility on the interest payments.

Most of the manufacturing firms employed debt structure as a key indicator in measuring and analyzing the financial health of the firm (Salim and Yadav 2012). The studies on debt structure patterns on the financial position of the company, the researchers have done a study to determine how financial resources of a company are effectively used to enhance the profitability position of the company (Gleason et al. 2000). For analyzing that, they have used significant debt structure patterns and profitability position of the company and in turn the valuation of shareholder's wealth (Salim and Yadav 2012). Debt structure measures the major debt patterns and frameworks of the sample firm. Whenever there is a turbulent and fluctuating economic condition, the company can raise funds through issuing debt instruments. In case of bad economic conditions, the debt structure of the company will have a negative influence on the profitability position of the company (Herciu and Ogrean 2017).

17.2 Review of Literature

The main objective of a corporate firm is to maximize the valuation of the shareholders. Many studies have been conducted to assess the impact of capital structure on profitability position of the company (Joshua 2015). Corporate firms generally focus on maximizing the wealth and valuation of equity shareholders through the drastic reduction in the overall cost of capital (OCC) and enhancing the market prices of the financial instruments (Amatya 2020). One of the ways of minimizing the overall cost of capital is to finance the corporate firm's capital through a proper mixture of debt content and equity content (DeMarzo and Fishman 2017). Corporate firms normally finance their business through the issue of debt or equity instruments (Chaklader and Chawla 2016). Many factors are to be taken into consideration while deciding the optimum mixture of debt and equity and most of the corporate firms find it a challenge to optimize the composition of the debt content and equity content in the process of increasing the value of the firm (Herciu and Ogrean 2017).

The pragmatic study was conducted to determine the significant positive relationship between the ratios of long-term and short-term debt solvency patterns and their effective influence on the profitability position of the sample company (Abor 2015). However, it is clear that there was a negative association between the major indicators of STDS & LTDS ("Short-Term Debt Structure" and "Long-Term Debt Structure") (Baker et al. 2011). It is also clear from the study that the STDS & LTDS have a significant influence on the Return on Capital Employed (ROCE). With respect to the rational relationship between various financial indicators of the corporate firm, many researchers studied the STDS & LTDS and its pragmatic impact on financial viability and effective performance of corporate firms (Baum et al. 2006).

17.3 Statement of the Problem

In order to achieve and sustain an optimum debt structure for the firm is one of the significant priorities in the turbulent business environment. In a couple of recent years, several empirical studies were conducted on the influence of capital structure patterns on the profitability position and pecuniary performance of the corporate firms. The desirable mixture of debt and equity is essential for maximizing shareholders' wealth. There was limited research on the impact of debt structure on the profitability position of the company. No study was found in the area of debt structure and its impact on the profitability position of the company by developing suitable accounting models. This paper aims to close this gap by providing some insights into the cogent relationship between debt structure and its influence on the profitability of Tata Steel.

17.4 Main Crux of This Pragmatic Study

(1) To pragmatically analyze the debt structure of Tata Steel by applying suitable financial indicators.
(2) To determine the Return on Total Assets (ROTA) as a measure of profitability of the sample company.
(3) To examine pragmatic association between debt content structure and profitability position of Tata Steel

17.5 Research Framework

The methodology of this research study is empirical in nature and the nitty–gritty of this research is to determine the cogent relationship between debt structure and profitability position of Tata Steel for the period of 2013 to 2022. This study also explores the degree to which the STD to TA, LTD to TA and TD to TA have an empirical effect on the profitability. Three financial indicators of STD to TA, LTD to TA and TD to TA were considered explanatory variables of this pragmatic study and the ROTA (Return On Total Asset) was taken as regressand variable. The capital structure of the sample company has become ubiquitous on the basis of profitability indicators of the company. For pragmatically achieving the primary objective of this study, the accounting framework was developed and modeled to identify the cogent relationship between regressand and regressors of this accounting model (Fig. 17.1). This accounting framework is deemed to be a direct linear model that designates the significant relationships to test the proposed hypotheses of this study.

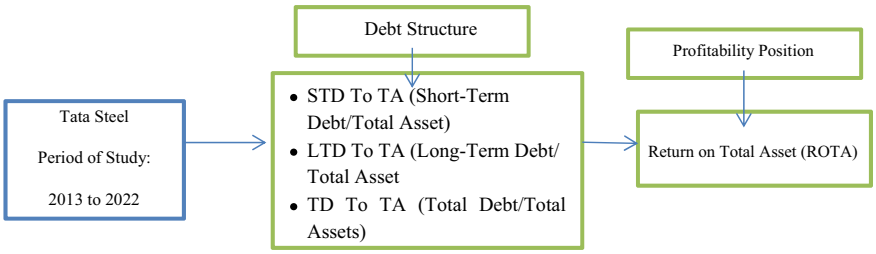

Fig. 17.1 Statistic relationship between debt structure and ROTA

17.6 Hypotheses of the Study

In this study, the following hypotheses were framed to figure out a cogent relationship between three indicators of debt content structure and one indicator of the profitability position.

- H_1: ROTA is significantly influenced by STDTA.
- H_2: ROTA is significantly influenced by LTDTA.
- H_3: ROTA is significantly influenced by TDTA.

17.7 Model Estimation:

Model 1: In model 1, the STD to TA (or STDTA) is taken as regressor and Return On Total Assets (ROTA) is taken as regressand. Symbolically the model is formed as follows:

$$ROTA = \beta_0 + \beta_1 STDTA + e_i$$

Model 2: In model 2, the STD to TA (or STDTA) and the LTD to TA (or LTDTA) are taken as regressors and Return On Total Assets (ROTA) is taken as regressand. Symbolically the model is formed as.

follows:

$$ROTA = \beta_0 + \beta_1 STDTA + \beta_2 LTDTA + e_i$$

Model 3: In model 3, Short-Term Debt to Total Asset (STDTA), Long-Term Debt to Total Asset (LTDTA) and Long-Term Debt (LTD) are taken as regressors and Return On Total Assets (ROTA) is taken as regressand. Symbolically the model is formed as follows:

$$ROTA = \beta_0 + \beta_1 STDTA + \beta_2 LTDTA + \beta_3 TDTA + e_i$$

17.8 Comparison of Three Estimated Models:

The outcome of the OLS estimators of the three models are summarized in Table 17.1. Three models are compared on the basis of the coefficient of Regressand, coefficient of Regressors, the R^2 statistical value, F-statistic value, Prob (F-statistic), AIC, SCHC and HQC.

The R^2 value of 0.909 is very high for Model 3 as compared to Model 1 and Model 2. The greater the statistical value of R^2, the better the accounting model developed in this research that the regressors have an influence on the regressand. The value of F-statistic is found to be very high in Model 3 and the Model 3 is highly significant in explaining the regressand (i.e., ROTA). Since the p-value (F-statistic) of Model 2 and Model 3 is less than 0.05 (the significance level taken for the study), we can safely reject the null hypothesis of this pragmatic study and determine that debt content structure has a substantial stimulus on the profitability position of Tata Steel.

The AIC (***Akaike Info Criterion), SCHC (Schwarz Criterion) and (HQC) Hannan-Quinn Criterion*** were generally employed to make a significant choice of the accounting models which are competing each other in terms of analyzing between regresand and regressors. The higher the statistical values of these OLS indicators, the worse the accounting model is predicting the study variable. In our study, Model 3 is the best model as the values of these criteria are the lowest as compared to statistical values of important criteria developed in Model 1 and Model 2. The lesser the statistical values of OLS criteria, the better the fitness of the accounting model developed in this research.

Managerial Implications

In this study, three econometric models were developed by academic researchers to analyze the influence of debt content structure patterns on the profitability position of Sample Company. For measuring debt structure and its rational influence on profitability position of the sample company, the accounting indicators of STDS and LTDS were employed in this empirical study. The outcome of this study clearly

Table 17.1 Comparison of three estimated models

Particulars	Model 1	Model 2	Model 3
Regressand	ROTA	ROTA	ROTA
Regressors	STDTA	STDTA & LTDTA	STDTA, LTDTA & TDTA
R-squared	0.053755	0.842566	0.909455
F-statistic	0.454467	18.73153	20.08839
Prob (F-statistic)	0.519222	0.001548	0.001568
Akaike info criterion	5.630923	4.037428	3.684271
Schwarz criterion	5.691440	4.128204	3.805305
Hannan-Quinn criterion	5.564536	3.937847	3.551497

Source Author compilation

indicated that there was a cogent association between the debt structure patterns and profitability position of the sample company. Since three accounting models clearly exhibited that the overall debt structure pattern has a pragmatic influence on the profitability of Tata Steel. In our study, Model 3 is found to be the best model based upon the OLS indicators such as OLS AIC, OLS SCHC and OLS HQC statistical estimators. It clearly indicated that the STDTA, LTDTA and TDTA have a pragmatic influence on Tata Steel's profitability position during the period of this study. Future studies can be conducted to include other accounting and financial indicators to determine debt structure patterns of companies in different sectors on the sustainable profitability.

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