



The Relation Between Capital Structure And Profitability On Selected Companies From Manufacturing Industries Of India.

Author

Dr. Amish Soni

Assistant Professor, Faculty of Management,
GLS University, Ahmedabad-380006.

Vikas Yadav

Student, Faculty of Management,
GLS University, Ahmedabad-380006.

Abstract

This research was carried out to study the relation between Capital structure and Profitability on selected companies as Aditya Birla Group, Arvind Textile Ltd., Hindustan Unilever Limited, ITC Limited, Berger Paints India Ltd. and Asian Paints from manufacturing industries of India. The existing literature primarily consists of studies regarding relationship between financial leverage, firm's size and fixed assets includes 5 financial years, viz. 2014-2015, 2015-2016, 2016-2017, 2017-18 and 2018-19. Literature regarding the nature of impact of capital structure on profitability is scarce. Also how the size of the firm and growth influences this relationship is also not very well known. Additionally, most of the studies are related to the developed economies and researches in emerging economies like Indian are very few. Thus, there is a need to flash some light on this relationship in Indian context. This study seeks to study the effect of capital structure on the profitability of Indian Manufacturing Industries such as textile, FMCG and paints listed on the Bombay Stock Exchange (BSE). With the help of the past five year's profitability and capital structure parameters we tried to predict the future impact of with the help of the forecasting models.

Keywords: Capital structure, Profitability, Leverage ratio, Manufacturing Industry.

1. Introduction:

The Firms can use either debt or equity capital to finance their assets. The best choice is a mix of debt and equity. Every firm seeks to design a perfect capital structure with an ideal ratio of debt and equity source of finance, which can minimize the overall cost of financing while maximizing the value of the firm. The issue of capital structure and its relationship with firm value gained attention with Modigliani and Miller's irrelevant proposition (1958). It proposed that capital structure choice has no effect on value of the firm under certain assumptions. These assumptions were: absence of corporate taxes, free access of market information to investors and no transaction cost. The present study mainly analyses how far the capital structure (CS) affects the Profitability (P) of manufacturing industries of India. The study tries to establish the hypothesized relationship as to how far the Capital structure affects the business revenue of firms and what the interrelationship is between CS and Profitability.

2. Literatures Review:

(Cuibing Wu (2019))It is critical to set a satisfactory capital structure to enhance the organisations a money-making country. This have a look at focuses on the dataset of 15 listed U.S. Production agencies at some point of a ten year duration (2009-2018), a period after the main money-primarily based trouble of 2007-2008. This look at affords expertise of the relationship between capital structure and a cash-making kingdom through examining the CR, TDE, TDTA, FS, ROA, and ROIC with a panel information analysis to set up four transferring backward models. The total Debt to fairness ratio to factor to/show the proportion of DEBT on equity worsens/decreases the ROA and ROIC. Companies with excessive able to be touched/actual treasured things are plausible for creditors. The firm length suggests a high quality relationship with a money-making kingdom. Companies with higher once-a-12 month's cash/money income are generally extra cash-making. Therefore, a clear focus on growing money/money income can lead to progressed a cash-making state for a company.

(Asst. Prof. Mrs. Deepanjali Babu Mazumder (2018)) One of the maximum crucial financing selections is to pick among the most suitable level of Debt and fairness in its capital shape. Because of this Capital Structure is the (related to handling cash) foundation for any enterprise. The analysis for dating among capital structure and a cash-making nation for 9 Infrastructural groups for the remaining 10 years, present look at indicates that the corporations (being concept about carefully) have no longer intense/medium-stage debt-equity composition in their capital shape and because of this ought to awareness on enhancing their existing capital structure so that, the groups can revel in the benefits of power/gain.

(D.K.Y Abeywardhana (2019))This have a look at has tested the connection among capital structure and the money-making ability of non-(associated with handling cash) SMEs in the UK throughout 1998-2008. The effects display a substantial dating with capital structure and a money-making country which is negatively associated. The size of the organization seems extra vital thing that comes to a decision/figures out the cash-making capability in SMEs within the UK. Thereis constant (occasion(s) or object(s) that show some thing for fine length- a cash-making kingdom dating The guess effects factor to/display a bad courting with the cash-making capability and gearing ratiofor both measures of a money-making nation. The identical relationship is shown for the opposite measure of electricity/benefit (TDA) and a money-making kingdom for all guesses and the consequences

additionally (a large alternate in numbers meaning something essential). This is an indication that SMEs in agreeing with/matching up with/working often with the reason (of why something works or happens the way it does) that asserts better the danger greater the return.

(LILIAN NJERI GICHUHI (2016)) The examine concluded that indexed corporations had been profitable and efficiency within the look at duration. Based at the findings, the corporations applied debt which minimized their fee of financing and operational charges. There lacked a correlation amid capital structure, company length, leverage and profitability of indexed corporations. Operating performance was found to be weakly correlated to profitability. It becomes additionally concluded that the unbiased variables defined most effective eighteen percent variance in profitability of indexed corporations.. The regression version applied changed into determined to be tremendous. It turned into concluded that there existed a mere link amid capital structure and profitability of registered groups. Capital structure and running performance had been located to be undoubtedly associated with profitability of indexed firms.

(Kavita Chavali, Shireen Rosario (2018)) The intended aim of carrying out this take a look at became to investigate the impact of capital structure (short-term- debt, long- time period- debt, overall debt, debt fairness ratio, and organization size) on financial performance as measured via go back on equity (ROE) and go back on belongings (ROA) for a period of 9 years starting in 2005. It changed into hypostasized that these elements aren't notably associated with corporation's profitability. The primary end result indicated that the total debt has a extensive terrible impact on ROE and ROA, while length in terms of sales has considerably poor impact handiest on ROE of the American companies. However, a quick debt notably has a effective have an effect on ROE. An insignificant either bad or effective relationship changed into found between long time debt, debt to equity and size in phrases of general belongings and profitability.

(Brahmadev Panda (2011)) This paper is an experiment to investigate the capital structure and its determinant of the Indian metallic corporations with the assist of the correlation evaluation, multiple regression analysis and stepwise regression analysis. It becomes discovered that the steel groups which can be taken as pattern are debt driven way depending greater on debt. If we keep in mind the signs of the regression coefficients then we located that those signs and symptoms are following the trend of trade off theory and no longer a lot of pecking order principle. However this observe has a few limitations like here the dimensions of the pattern is limited to simplest 66 corporations and confined to most effective one area. Hence extra sectors may be taken and a move sectional look at can be carried out.

(Nilesh P. Movalia (2015)) Capital shape is an essential selection of the enterprise to restoration the mixture of debt and fairness capital of the business enterprise. This observe is on capital shape analysis and its impact on profitability of tyres industry in India. Researcher has taken 14 tyres corporations indexed under BSE and NSE. By studying Debt-Equity ratio. From this paper it'd be concluded that there might be a large relation among capital systems (Deb-Equity) Ratio) on profitability (Net Profit Ratio, ROI, ROCE) of tyre agencies in India. If agency keeps ideal capital shape (Deb-Equity Ratio) its enables to generate greater profit and vice versa. By reading capital structure and profitability of 14 indexed tyres businesses of India. It is found that there's a significant relation among capital shape and Profitability.

(Dr. Raphael Gwahula (2015)) This study analysed the impact of capital structure on profitability of listed manufacturing businesses in Tanzania the use of panel information of six corporations indexed within the Dar es Salaam Stock Exchange all through a 5 year length. The length changed into from 2009 to2013 in which 30 observations have been obtained. Panel facts for the selected agencies had been analysed using fixed effect regression statistical method to check the connection among capital shape variables and go back on asset (ROA) and random effect used to check the connection between capital shape variables and go back on equity (ROE).His study used panel records of 6 production companies for the duration of five years developing 30 observations of the statistics. Researcher analysed the relationship among capital structure variables (independent variables) in opposition to profitability variables (dependent variable). Fixed impact regression method changed into used to measure the relationship among capital shape and return on asset (ROA) even as random effect regression model used to check the relationship among capital structure and go back on equity of producing companies (ROE). Moreover, partial correlation technique also used to degree the connection among the study variables a good way to support the regression outcomes.

3. Objectives:

3.1 Primary Objective:

- To study the capital structure and profitability parameters of selected manufacturing companies of India

3.2 Secondary objective:

- To identify the dependency between capital structure and profitability parameters of selected manufacturing companies.
- To examine the difference between the means of capital structure and profitability of Indian manufacturing companies
- To examine the relationship between capital structure and profitability of Indian manufacturing companies.
- To develop the forecasting model through profitability and capital structure parameters of selected manufacturing companies of India.

4. Research Methodology:

4.1: Research Design

Descriptive research study

4.2: Population

All the manufacturing sectors in India

4.3: Sampling Frame

Registered companies in manufacturing sector in stock indices

4.4: Sampling Method

Non probability convenience sampling method

4.5: Sample Size

From last five years; 2014-2015, 2015-2016, 2016-2017, 2017-18 and 2018-19, six companies i.e. Aditya Birla Group, Arvind Textile Ltd., Hindustan Unilever Limited, ITC Limited, Berger Paints India Ltd. and Asian Paints from manufacturing industries of India.

4.6: Statistical Tool and Techniques

Microsoft Excel as statistic tool and fundamental analysis, correlation and regression model used as statistical techniques.

4.7: Variables

In this study, there are three types of variables which are dependent variables, independent variables, and control variables. In a regression model, the dependent variables are explained by independent variables and control variables.

In this study, the profitability is dependent variable represented by Return On Assets (ROA) and Return On Invested Capital (ROIC).

Meanwhile, the capital structure is represented by three independent variables using the following three ratios: Total Debt to Equity (TDE), Coverage Ratio (CR), and Total Debt to Tangible Assets (TDTA). The control variable is Firm Size (FS). These ratios used in this study.

4.7: Hypothesis

H1o: Less dependency between ROA (profitability parameter) to capital structure.

H1a: ROA (profitability parameter) is dependent to capital structure.

H2o: There is no difference between means of ROA (profitability parameter) to capital structure parameters.

H2a: There is a difference between means of ROA (profitability parameter) to capital structure parameters.

H3o: Less dependency between ROIC (profitability parameter) to capital structure.

H3a: ROIC (profitability parameter) is dependent to capital structure.

H4o: There is no difference between means of ROIC (profitability parameter) to capital structure parameters.

H4a: There is a difference between means of ROIC (profitability parameter) to capital structure parameters.

H5o: Negative correlation between return on assets and total debt to equity

H5a: Positive correlation between return on assets and total debt to equity

H6o: Negative correlation between return on invested capital and total debt to equity

H6a: Positive correlation between return on invested capital and total debt to equity

H7o: Negative correlation between return on assets and coverage ratio.

H7a: Positive correlation between return on assets and coverage ratio.

H8o: Negative correlation between return on invested capital and coverage ratio.

H8a: Positive correlation between return on invested capital and coverage ratio.

H9o: Negative correlation between return on assets and total debt to tangible assets.

H9a: Positive correlation between return on assets and total debt to tangible assets.

H10o: Negative correlation between return on invested capital and total debt to tangible assets

H10a: Positive correlation between return on invested capital and total debt to tangible assets.

5. Results and Discussion:

5.1: Variables and model discussion

Table 1: Variable bifurcation

Particulars	Variables	Formula
Dependent variables: (Profitability Parameters)	Return On Assets	ROA = Net Income / Total Assets
	Return on Invested Capital	ROIC = Net Income / Invested Capital
Independent variables: (Capital Structure Parameters)	Total Debt to Equity	TDE = Total Debt / Equity
	Coverage Ratio	CR = EBIT / Interest Cost
	Total Debt to Tangible Assets	TDTA = Total Debt / Tangible Assets
Control variable:	Firm Size	FS = Ln (Annual Revenue)

Based on the introduction of common panel data regression model and hypothesis as well as variables, the regression models are built as below:

$$\text{Model 1: ROA} = C + \alpha_1\text{CR} + \alpha_2\text{TDE} + \alpha_3\text{FS}$$

$$\text{Model 2: ROA} = C + \alpha_1\text{CR} + \alpha_2\text{TDTA} + \alpha_3\text{FS}$$

$$\text{Model 3: ROIC} = C + \beta_1\text{CR} + \beta_2\text{TDE} + \beta_3\text{FS}$$

$$\text{Model 4: ROIC} = C + \beta_1\text{CR} + \beta_2\text{TDTA} + \beta_3\text{FS}$$

Table 2: Fundamental analysis summary from 2015 to 2019

Particulars	2019	2018	2017	2016	2015
Return on Assets	1.2358	1.2567	1.3190	1.3149	0.8669
Return on Capital Employed	4.7851	4.9792	3.2554	3.1059	2.2713
Total Debt/Equity	2.9244	2.9065	2.6775	3.0734	2.3043
Coverage Ratio	0.7968	0.2807	0.3046	-0.5977	-1.9000
Total Debt to Tangible Assets	7.7075	6.7461	7.0092	7.3963	4.6310
FS = Ln (Annual Revenue)	8182.50	7204.88	6641.01	6072.00	1853.51

5.2 Results of Panel data models

Based on the introduction of common panel data regression model and hypothesis as well as variables, the regression models are built as below:

Table 3: Regression Table and ANOVA for ROA (profitability parameter) & Capital structure parameters (TDE, CR and TDTA)

<i>Regression Statistics</i>	
Multiple R	0.87766
R Square	0.77028
Adjusted R Square	0.42571
Standard Error	0.35604
Observations	6

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	3	0.85013	0.28338	2.23547	0.323953582
Residual	2	0.25353	0.12676		
Total	5	1.10366			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	1.23892	0.30137	4.11099	0.05439	-0.05776	2.53560
Total Debt/Equity (X)	0.00000	0.00000	2.29849	0.14830	0.00000	0.00001
Coverage Ratio	-0.00034	0.00113	-0.29878	0.79329	-0.00519	0.00451
Total Debt to Tangible Assets	-0.00203	0.07752	-0.02622	0.98146	-0.33556	0.33149

From the above highlighted R square value that is 0.770284, we can interpret 77.0284% dependence of ROA with the capital structure.

H1o: Less dependency between ROA (profitability parameter) to capital structure.

H1a: ROA (profitability parameter) is dependent to capital structure.

Hence, H1o is rejected and H1a is accepted which means ROA (profitability parameter) is dependent to capital structure.

ANOVA table shows significant F test value that is 0.323953, from the value we can interpret as follows:

H2o: There is no difference between means of ROA (profitability parameter) to capital structure parameters.

H2a: There is a difference between means of ROA (profitability parameter) to capital structure parameters.

Hence, H2o is accepted and H2a is rejected which means there is no significant difference between the means of ROA to capital structure parameters.

$$\begin{aligned} \text{Model 1: } \text{ROA} &= C + \alpha_1\text{CR} + \alpha_2\text{TDE} + \alpha_3\text{FS} \\ &= 1.23892037 - 0.00033694\text{CR} + 0.00000419\text{TDE} - 1\text{FS} \end{aligned}$$

$$\begin{aligned} \text{Model 2: } \text{ROA} &= C + \alpha_1\text{CR} + \alpha_2\text{TDTA} + \alpha_3\text{FS} \\ &= 1.23592037 - 0.00033684\text{CR} - 0.00203275\text{TDTA} + 1\text{FS} \end{aligned}$$

Table 4: Regression Table and ANOVA for ROIC (profitability parameter) & Capital structure parameters (TDE, CR and TDTA)

<i>Regression Statistics</i>	
Multiple R	0.7852
R Square	0.6165
Adjusted R Square	0.0413
Standard Error	65.0397
Observations	6.0000

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	3.0000	13602.2944	4534.0981	1.0719	0.5159
Residual	2.0000	8460.3219	4230.1610		
Total	5.0000	22062.6163			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	67.2048	55.0526	1.2207	0.3466	-169.6674	304.0770
Total Debt/Equity (X)	0.0005	0.0003	1.5154	0.2689	-0.0009	0.0019
Coverage Ratio	-0.0502	0.2059	-0.2437	0.8302	-0.9363	0.8359
Total Debt to Tangible Assets	-9.4713	14.1603	-0.6689	0.5725	-70.3982	51.4556

From the above highlighted R square value that is 0.616531, we can interpret 61.6531% dependence of ROIC with the capital structure.

H3o: Less dependency between ROIC (profitability parameter) to capital structure.

H3a: ROIC (profitability parameter) is dependent to capital structure.

Hence, H3o is rejected and H3a is accepted.

ANOVA table shows significant F test value that is 0.5159, from the value we can interpret as follows:

H4o: There is no difference between means of ROIC (profitability parameter) to capital structure parameters.

H4a: There is a difference between means of ROIC (profitability parameter) to capital structure parameters.

Hence, H4o is accepted and H4a is rejected which means there is no significant difference between the means of ROIC to capital structure parameters.

Model 3: $ROIC = C + \beta_1CR + \beta_2TDE + \beta_3FS$
 $= 67.2 - 0.05CR + 0.0005TDE + 1FS$

Model 4: $ROIC = C + \beta_1CR + \beta_2TDTA + \beta_3FS$
 $= 67.2 - 0.05CR - 9.47TDTA + 1FS$

5.3: Correlation

Based on the models built above, the hypotheses can be tested.

- H5o: Negative correlation between return on assets and total debt to equity.
- H5a: Positive correlation between return on assets and total debt to equity
- H6o: Negative correlation between return on invested capital and debt to equity
- H6a: Positive correlation between return on invested capital and debt to equity

Table 5: Correlation result of profitability ratios and Total Debt to equity

Particulars	Correlation
Profitability ratios and Total Debt to Equity(TDE)	
ROA To Total Debt to Equity	-0.358402075
ROIC to Total Debt to Equity	-0.374682445

One profitability parameter that is ROA and ROIC shows negative relation with Total Debt to Equity from Table 5. As the results showed, the H5o and H6o are rejected.

- H7o: Negative correlation between return on assets and coverage ratio.
- H7a: Positive correlation between return on assets and coverage ratio.
- H8o: Negative correlation between return on invested capital and coverage ratio.
- H8a: Positive correlation between return on invested capital and coverage ratio.

Table 6: Correlation result of profitability ratios and coverage ratio

Particulars	Correlation
Profitability ratios and CR	
ROA and Coverage ratio	0.386656711
ROIC and Coverage ratio	0.375167066

H7o and H8o are rejected from table 6. It indicates that the CR ratio is positively related to profitability parameters. When the value of correlation between profitability and CR is positive in the variables, the ROA and ROIC ratios show positive correlation the CR ratio is significant. Therefore, the CR ratio has a significantly positive relationship with profitability.

- H9o: Negative correlation between return on assets and total debt to tangible assets.
- H9a: Positive correlation between return on assets and total debt to tangible assets.
- H10o: Negative correlation between return on invested capital and total debt to tangible assets.
- H10a: Positive correlation between return on invested capital and total debt to tangible assets.

Table 7: Correlation result of profitability ratios and Total Debt to Total Assets

Particulars	Correlation
Profitability ratios and TDTA	
ROA and TDTA	0.022352593
ROIC and TDTA	-0.272609197

One profitability parameter that is ROA shows positive relation with TDTA and other profitability parameter that is ROIC shows negative relation with TDTA from Table 7. As the results showed, the H7o is rejected, and H8o is accepted.

6. Conclusions:

- Hypothesis 1 and 3 (H1 and H3) concludes more than 50% dependence over the capital structure, signifies profitability is dependent on the capital structure
- Hypothesis 2 and 4 (H2 and H4) concludes more than 50% dependence over the capital structure, signifies profitability is dependent on the capital structure
- This examine offers perception into the relationship among capital structure and profitability by inspecting the CR, TDE, TDTA, FS, ROA, and ROIC with a panel facts evaluation to set up 4 regression models.
- All four models show a significant relationship between capital structure and profitability for Indian manufacturing companies over the last five year period (2014-2019) and with the help of the model you can forecast the profitability.

- The total debt to equity ratio to indicate the percentage of debt on equity has a negative impact on the ROA and ROIC. Therefore, low debt used in a company would raise the company's profitability.
- Coverage ratio which represents the ability of earnings before interest and tax to pay off the cost of debt has a positive relationship with the profitability. This shows that a high CR can improve the company's profitability and a low level of debt cost can increase the company's profit.
- The total debt to tangible assets ratio has demonstrated negative impact on the profitability. That means the tangible assets have a significantly positive effect on profitability. Companies with high tangible assets are credible for lenders.

References

https://scholarworks.moreheadstate.edu/cgi/viewcontent.cgi?article=1342&context=msu_theses_dissertations

<http://www.iosrjournals.org/iosr-jbm/papers/Conf.17037-2017/Volume-5/2.%2006-11.pdf>

http://globalbizresearch.org/economics/images/files/21095_ID_1084_JEIEFB_Abeywardhana.pdf

[https://www.ijbmi.org/papers/Vol\(3\)12/Version-1/G031201054061.pdf](https://www.ijbmi.org/papers/Vol(3)12/Version-1/G031201054061.pdf)

<http://vslir.iima.ac.in:8080/jspui/bitstream/11718/11485/1/BF-PP-314->

[Capital_Structure_of_Indian_Steel_Companies-319-Panda_b.pdf](http://vslir.iima.ac.in:8080/jspui/bitstream/11718/11485/1/BF-PP-314-Capital_Structure_of_Indian_Steel_Companies-319-Panda_b.pdf)

<http://www.ijrar.org/papers/IJRAR1944793.pdf>

http://www.pbr.co.in/2015/2015_month/Sep/10.pdf

http://repository.out.ac.tz/1346/1/DISSERTATION_-SICHIZYA_STEVEN_FRED-PDF.pdf

