



A study of impact of capital structure on profitability of selected listed chemical companies of Gujarat

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Abstract

The present research work focuses on the investigations on impact of capital structure on profitability for thirteen listed chemical firms in Gujarat, India for the tenure of seven financial years. For this purpose different capital structure and profitability ratios were investigated from annual reports of the chemical firms. After comparison of different ratios and statistical analysis, conclusions about the research were declared.

Keywords: Capital structure, profitability, statistical analysis

Introduction

According to Omairi and Matriano (2022) ^[5], the ability of a company to generate more money than it spends is referred to as profitability. Managers make decisions that are all strategic and based on cost-volume-profit analyses. It's important to remember that the client is the foundation of all corporate operations. Either the customer requests the item and pulls them from the enterprise, or the corporation discovers the needs and delivers them to the customer. When establishing total profitability, companies calculate the cost of goods sold to determine product profitability. As a result, the company evaluates both successful and non-profitable customers at the same time. According to them, a vital factor affecting the profitability is capital structure. Brigham and Ehrhardt (2008) ^[1], defined capital structure as "the firm's mixture of debt and equity"; they also discussed the concept of capital structure decision, in conjunction with Brealey *et al.* (2014) ^[2]. They jointly defined it as "The choice between debt and equity financing". On the issue of capital structuring Aishwarya (2022) ^[3] also reported that capital structure make best use of the market worth of a company that is if a company requiring an appropriately intended capital structures the collective worth of the rights and proprietorship benefits of the stockholders are exploited. Considering the facts the present research is devoted to the investigations on capital structuring of chemical industry. For this purpose, the chemical industry sector of Gujarat state has been targeted, and thirteen listed firms have been highlighted. For the purpose of comparison, comparative analysis of ratios and statistical analysis approaches have been use. Following points represent the objectives of the research:

- To study the factors influencing capital structure of select firms based on asset size and business revenue;
- To study the relationship between profitability and capital structure;
- To determine the factors that will influence the decision making in the choosing the components of capital structure; and
- To suggest adoption of capital structure towards better performance of the chemical industries.

Literature Review

The present section is devoted to the contributions of different researchers in the field of capital structure and profitability, a brief of which is presented as follows:

▪ **Moustapha and Benziane (2022)** ^[6]

This paper aims to reveal the relationship between capital structure variables and the Profitability of Islamic banks. The examination has been performed using panel data for a sample of 05 Islamic banks operating in the Gulf Cooperation Council GCC countries (2010-2020).

▪ **Phan *et al.* (2022)**

The purpose of this research is to determine the effect of capital structure on the profitability of Vietnamese commercial banks.

▪ **Omairi and Matriano (2022)** ^[5]

The aim of the study is mainly to understand the capital structure of Securado Company and the technique used to raise its profitability.

▪ **Dewi and Fachrurrozie (2021)** ^[7]

The purpose of this research is to analyze the effect of profitability, liquidity, and asset structure on capital structure with firm size as a moderating variable.

▪ **Musah (2018)** ^[8]

The study examined the effect of capital structure (measures as short term debt ratio, long term debt ratio, and total debt ratio) on profitability (measured as Return on Assets and Return on equity) of commercial banks in Ghana.

1. Gaps in the Research

Following points represent the gaps in the research:

- There is very limited research which focuses on the capital structure and profitability of chemical industries in Gujarat state of the country; and
- There is almost nil research work found which focuses on the ranking of Gujarat based chemical industries.

Solution Methodology

In the present research work, investigations on different capital structure and profitability ratios were carried out, the details of which are presented as follows:

a. Debt- Equity Ratio (D-E Ratio)

Ratio of total debts and net worth

b. Equity – Asset Ratio (Equity Ratio)

Ratio of net worth and total assets

c. Interest Coverage Ratio (ICR)

Ratio of earnings before interest and tax and interest

d. Financial Leverage

Ratio of earnings before interest and tax and earnings before tax

e. Debt – Asset Ratio

Ratio of total debts and total assets

f. Short term debts to total assets ratio (STDR)

Ratio of short term debts and total assets

g. Long term debts to total assets ratio (LTDR)

Ratio of long term debts and total assets

h. Return of Capital Employed (ROCE)

Ratio percentage of operating profit and capital employed

i. Return of Equity (ROE)

Percent ratio of net profit and equity shareholders fund

j. Return of Assets (ROA)

Percentage ratio of net profit and total assets

k. Net Profit Margin (NPM)

Percentage ratio of net profit and sales

Besides these ratios, for the purpose of statistical analysis, the following tools were used:

- a. Hypothesis testing;
- b. Correlation analysis; and
- c. Multiple regression analysis.

Note: All three tools are used but due to limited pages and tables were allowed we are showing only correlation analysis

Case Study

During the research work, following thirteen listed chemical firms were targeted and with the help of their annual reports, different capital structure and profitability ratios were investigated.

- a. Aarti Industries Limited
- b. Asahi Songwon Colors Limited
- c. Atul Limited d) Bodals Chemicals Ltd
- d. Bodals Chemicals Ltd
- e. DCW Ltd
- f. Deepak Nitrate Limited
- g. Dynamic Industries Ltd
- h. GNFC Ltd
- i. Gujarat Alkalies and Chemicals Ltd
- j. Gujarat Fluorochemicals Limited
- k. Ishan Dyes & chemicals Ltd
- l. Kiri industries Ltd
- m. Meghmani Organics Ltd

Statistical Analysis of Chemical Firms

The present section is focused on statistical analysis of received data from different firms for the last seven years, and presents hypothesis testing using ANOVA, correlation and regression analysis, the details of which are presented in upcoming sub-sections.

1. Correlation Analysis of Profitability Ratios and Capital Structure Ratios

In order to study the correlation between profitability ratios and capital structure ratios, the following hypothesis was used:

H_{0p&cs1}: There is no significant relationship between profitability ratios and capital structure ratios for the selected chemical industries in Gujarat over the period of study

H_{0p&cs2}: There is significant relationship between profitability ratios and capital structure ratios for the selected chemical industries in Gujarat over the period of study

In order to fulfill above hypothesis, different sub-hypotheses were formulated and tested, the details of which are presented as follows:

a. Correlation between NPM and Capital Structure Ratios

H_{0p&cs1}: There is no significant relationship between NPM and capital structure ratios for the selected chemical industries in Gujarat over the period of study

H_{0p&cs2}: There is significant relationship between NPM and capital structure ratios for the selected chemical industries in Gujarat over the period of study

Table 1: Correlation of NPM with ratios of Capital structure

Correlation of NPM with	r	p-value
Debt-equity ratio	0.989**	0
Equity-asset ratio	0.671**	0.032
Debt ratio	0.881*	0
STDR	0.886*	0
LTDR	0.783	0
Financial leverage	-0.868*	0

From the above table, it can be found that as the value of p is less than 0.05 for all variables of capital structure, the null hypothesis gets rejected, which shows the significant relationship between NPM and ratios of capital structure. The tables also shows the details of correlation of NPM with different capital structure ratios, which are positive or negative, depending on their extent of relationships.

b. Correlation between ROCE and Capital Structure Ratios

H_{0p&cs2}: There is no significant relationship between ROCE and capital structure ratios for the selected chemical industries in Gujarat over the period of study

H_{0p&cs2}: There is significant relationship between ROCE and capital structure ratios for the selected chemical industries in Gujarat over the period of study

Table 2: Correlation of ROCE with ratios of Capital structure

Correlation of NPM with	r	p-value
Debt-equity ratio	-0.861*	0
Equity-asset ratio	-0.775*	0
Debt ratio	0.981**	0
STDR	0.886*	0
LTDR	0.783	0.012
Financial leverage	-0.868*	0

From the above table, it can be found that as the value of p is less than 0.05 for all variables of capital structure, the null hypothesis gets rejected, which shows the significant relationship between ROCE and ratios of capital structure. The tables also shows the details of correlation of ROCE with different capital structure ratios, which are positive or negative, depending on their extent of relationships.

c. Correlation between ROE and Capital Structure Ratios

H_{0p&cs3}: There is no significant relationship between ROE and capital structure ratios for the selected chemical industries in Gujarat over the period of study

H_{0p&cs3}: There is significant relationship between ROE and capital structure ratios for the selected chemical industries in Gujarat over the period of study

Table 3: Correlation of ROE with ratios of Capital structure

Correlation of NPM with	r	p-value
Debt-equity ratio	-0.861**	0
Equity-asset ratio	0.775*	0
Debt ratio	-0.981**	0.023
STDR	0.886*	0
LTDR	-0.783**	0
Financial leverage	0.868*	0

From the above table, it can be found that as the value of p is less than 0.05 for all variables of capital structure, the null hypothesis gets rejected, which shows the significant relationship between ROE and ratios of capital structure. The tables also shows the details of correlation of ROE with different capital structure ratios, which are positive or negative, depending on their extent of relationships.

d. Correlation between ROA and Capital Structure Ratios

H_{0p&cs4}: There is no significant relationship between ROA and capital structure ratios for the selected chemical industries in Gujarat over the period of study

H_{0p&cs4}: There is significant relationship between ROA and capital structure ratios for the selected chemical industries in Gujarat over the period of study

Table 4: Correlation of ROA with ratios of Capital structure

Correlation of NPM with	r	p-value
Debt-equity ratio	0.861**	0
Equity-asset ratio	-0.775**	0
Debt ratio	0.981**	0
STDR	0.886*	0
LTDR	0.783*	0
Financial leverage	-0.868**	0.02

From the above table, it can be found that as the value of p is less than 0.05 for all variables of capital structure, the null hypothesis gets rejected, which shows the significant relationship between ROA and ratios of capital structure. The tables also shows the details of correlation of ROA with different capital structure ratios, which are positive or negative, depending on their extent of relationships.

Conclusion and Limitations and Future Scope of the Research Work

The present section portrays the details of conclusion, limitations and future scope of the research, the details of which are presented in upcoming sub-sections.

1. Conclusion

The present research work was based on in investigations on the effect of capital structure on profitability for the listed chemical industries in Gujarat for the period of seven years. For this purpose, the chosen firms were Aarti Industries Limited, Asahi Songwon Colors Limited, Atul Limited, Bodals Chemicals Ltd, Bodals Chemicals Ltd, DCW Ltd, Deepak Nitrate Limited, Dynamic Industries Ltd, GNFC Ltd, Gujarat Alkalies and Chemicals Ltd, Gujarat Fluorochemicals Limited, Ishan Dyes & chemicals Ltd, Kiri industries Ltd, and Meghmani Organics Ltd. For the purpose of analysis, different ratios used in association with capital structure and profitability were debt-equity ratio, equity-asset ratio, Debt ratio, STDR, LTDR, and financial leverage, and NPM, ROCE, ROE, and ROA, respectively. For the purpose of data collection, information was annual reports from the firms and stock market websites were referred. After analyzing the data for different firms, individually and collectively, the following conclusions were drawn:

- All the firms have shown remarkable progress in last seven years;
- All the firms have well established capital structures; and
- All the firms show continuously increasing trend of profitability.

In the next stage, statistical analysis for investigating the effect of capital structure on profitability for different firms was carried out. For this purpose, ANOVA driven hypothesis testing was carried out, which shows the following conclusion.

- There is significant difference in the capital structure of the selected chemical industries in Gujarat over the period of study; and
- There is significant difference in the profitability of the selected chemical industries in Gujarat over the period of study

In the next stage, correlation analysis for investigating the relationship among profitability ratios and capital structure ratios was carried out, which yielded the following conclusion.

- There is significant relationship between profitability ratios and capital structure ratios for the selected chemical industries in Gujarat over the period of study

In the next stage, multiple regression analysis for investing the extent of relationship among capital structure ratios and profitability ratios was carried out, the conclusion from which is presented as follows

- There is significant impact of capital structure ratios on profitability ratios for the selected chemical industries in Gujarat over the period of study

1.1 Recommendations to the Firms

Following points represent the recommendations to the firms

- a. The firms which have shown the downfall in parameters are suggested to pay attention on the responsible parameters, and try to maintain the continuous progress in the parameters.

2. Limitations and Future Scope of the Research Work

The following points represent the limitations of the research work:

- a. The research work is limited to industry located in a particular state;
- b. The research work is limited to a particular type of industry and focuses only on listed firms;
- c. The research work is also made limited by the number of capital structure and profitability ratios used;
- d. The research work is also limited to statistical analysis only and limited number of tools.

Based on the limitations, the following points represent the future scope of the research work:

- a. A broader research considering a group of states or even country may be initiated
- b. An extensive research work considering a broader set of industries and or greater number of firms in a particular industry may be called;
- c. A new research consisting of a broader set of investigating parameters may be initiated; and
- d. A broader research involving a greater number of analyses and a large set of tools may be started.

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