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Impact of Capital Structure on the Financial Performance of Firms: A Study of BSE Listed Selected Pharmaceutical Companies

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Abstract

The Capital Structure of a firm affects debt and equity. In this study, an investigation has been made to analyze the impact of capital structure on the selected pharmaceutical company's financial performance over a period from 2016 to 2020 of 20 BSE listed Pharmaceutical companies are taken based on market capitalization, and the average of all the ratios are calculated and considered. To analyze the considered sample of data, correlation and multiple regression analysis is being used. The findings of the study shows that there is a negative relationship between Capital structures such as Debt Equity Ratio, Debt Ratio, and Profitability Ratios (ROE, ROA, Net Profit Margin) and also a positive relationship between Equity Ratio (Capital structure) and Profitability Ratios (ROE, ROA, Net Profit Margin). Moreover, the capital structures are not statistically influenced by ROE as profitability ratio, but each of the capital structures is statistically influenced by ROA and Net Profit Margin.

Keywords: Capital structure • Profitability ratios • Financial performance

Introduction

The capital structure of a company lays the basis for the capital cost of the company. The costs of debt and equity depend on the market conditions prevailing and the choice the company exercises impacts its performance over the long term. The factors that influence the company's decision include the nature of its business, its reputation, the gestation period of its project, and the expected pattern of its cash flows. Given the cost differential between debt and equity and the tax benefits associated with debt, the capital structure decision will influence the company's performance. The capital structure is also influenced by the sector in which the company is operating. Keeping this in view, an attempt has been made in this paper to examine the relationship between a pharmaceutical company's capital structure and its financial performance. It will help the manager to make appropriate decisions on constructing a proper capital structure for a company. The recent Covid-19 outbreak proved that pharma companies are compelling for long-term investors. This study would help those who wish to invest in pharma companies and the companies' management to review their capital structure decisions.

Literature Review

Goyal studied the significance of capital structure on the performance of Public sector banking from 2008 to 2012. The study stated a positive relationship between the short-term debt to capital ratios on all the profitability ratios and a negative relationship between Loner term debt to capital ratio and profitability ratios such as ROA, ROE, and EPS of the Indian Public sector banks

Taani evaluates the relationship between capital structure and performance of 45 listed manufacturing companies in Amman stock exchange, Jordan. The study found that the capital structure is not an essential factor in a firm's financial performance using multiple linear regression analysis. The study used Return on Assets and Profit margin as performance indicators, long-term debt to total assets, Short-term debt to total assets, and Total debt to Equity as capital structure variables

Nirajini analysis using a simple regression method shows that the capital structure has a positive relationship and significant impact on trading companies' financial performance in Sri Lanka. Further, the study found that there exists a correlation between debt asset ratio, debt-equity ratio, long term debt with a Gross Profit Margin (GPM), Net Profit Margin (NPM), Return on Capital Employed (ROCE), Return on Asset (ROA) and Return on Equity (ROE) Mumtaz worked on the sample data of 83 private companies from the listed firms on the Karachi Stock Exchange (KSE). The considered sample of data has been analyzed through regression techniques. The study suggests that the capital structure significantly impacts firms' financial performance and negatively relates to financial performance. Moreover, the capital structure of a firm has a negative relationship with its market value. It also increases the risk level as the share of debt increases in the capital mix Jawade focused on Indian Pharmaceutical companies based on Market capitalization. It found that the companies are very cautious about the optimal selection of capital structure. Pharma companies under the study have not shown any inclination for the Pecking order theory. Based on a sample of six pharmaceutical companies, the research found that these companies were conservative in their approach to capital structure decisions despite their financial strength

Movalia examined the capital structure and profitability of selected Indian tyre companies. This study used Durbin Watson Statistics for testing the developed hypotheses. Significant companies like MRF, Apollo Tyres, Dunlop India, and Modi Rubber showed a positive relationship between capital structure and financial performance Nawaz investigated the significance of financial leverage on cement manufacturing companies' profitability in Pakistan using the ordinary least square simple regression model. Data for six years of a sample of 18 cement firms listed on the Karachi Stock Exchange (KSE) was considered and analyzed using the Ordinary Least Square Simple Linear Regression technique. For this technique, the dependent variable is profitability (ROA), and the independent variable is financial leverage. The study accepted the hypothesis that there is a negative relationship between financial leverage and profitability ratio (i.e.,) ROA

Bhatnagar and Dr. Vinod shows a significant relationship between capital structure and profitability. This study considered five companies such as Dabur, Emami, Everest, Godrej, and ITC, and analyzed the data using the simple linear regression technique

Basit stated that the independent variable 'debt to equity ratio' was

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significantly correlated to dependent variables such as earnings per share, return on equity, and return on assets. The study used data from 50 Pakistani companies from different sectors such as Chemical, Food, and Care products, Cement, Pharmaceutical, Auto assembler, and Textile. Hypothesis testing was done using the Pearson correlation coefficient and the multiple linear regression model

Das identified the determinants of capital structure and analyzed the impact of capital structure on financial performance. Data of 50 manufacturing companies for ten years was considered to examine the impact of capital structure on financial performance as reflected in Return on Equity (ROE), Return on Asset (ROA), Return on Capital Employed (ROCE), and Earning per Share (EPS). The capital structure was quantified using the Current Ratio (CR), Long term debt to Total Assets (LD_TA), Total Debt to Total Assets (TD_TA), and Debt Equity Ratio (DER). Multiple Regression was employed to analyze the impact of capital structure on financial performance. The study finds a significant relationship between ROA, ROE, ROCE, and Capital Structure variables. One of the hypotheses, which stated a relationship between EPS and Capital Structure variables was rejected

As a study has not been conducted on the impact of capital structure on financial performance of pharmaceutical companies, this paper proposes to conduct this analysis.

Research Problem and Methodology

The study's main objective is to analyze the impact of capital structure on the selected pharmaceutical company's financial performance. Moreover, to analyze whether the capital structure, which is seen in terms of various ratios like Debt Equity Ratio, Debt Ratio, and Equity Ratio has a negative or positive relationship between the financial performance that is measured using the ratios such as Return on Equity, Return on Assets, Net Profit Margin the relationships between these variables have also been studied. Drawing from the literature given above, the sample data analysis is done through correlation analysis and multiple linear regression using the R Programming language.

About the dataset used

For this study, a sample of 20 BSE listed Pharmaceutical companies are taken based on market capitalization over a period from 2016 to 2020. The data has been taken from the website of money control.com and the selected pharmaceutical companies' annual reports. The average of all the ratios is calculated and considered for the study.

Table 1 shows the selected BSE listed Pharmaceutical companies for the study.

Variables: The independent variables used for the study are debt-equity ratio, debt ratio, and equity ratio, and dependent variables as Return on Assets, Return on Equity, and Net Profit Margin.

The Debt-Equity Ratio is a measure of capital structure, and it is calculated using the following formula:

- Debt-equity ratio=Long termborrowing/Shareholders fund.

The debt ratio can be calculated by dividing the Long-term borrowings with Total assets:

- Debt ratio: Long term borrowings/Total assets

The equity ratio measures the relative proportion of equity used by a company for financing its assets, which can be calculated by the following formula:

- Equity ratio: Shareholders fund/Total assets

Net profit margin shows the profitability of the company. The following is the formulafor calculating net profit margin:

- Net profit margin: Net profit/total revenue

S.No	Companies
1	Sun pharma
2	Dr Reddys labs
3	Cipla
4	Torrent pharma
5	Aurobindo pharma
6	Lupin
7	Cadila health
8	Alkem lab
9	Glaxo smith kline
10	Ipca labs
11	Alembic pharma
12	Laurus labs
13	Ajanta pharma
14	Glenmark
15	Jubilant life
16	Granules india
17	Aarti drugs
18	Eris life
19	FDC caplin point
20	Laboratories

Table 1. List of selected companies.

ROE and ROA measure the financial performance of a company. It can be calculated using the following formulas:

- Return on Equity: Net income/Shareholders fund
- Return on Assets: Net income/total assests

Research hypothesis testing

Following are the hypotheses developed to investigate the effectof capital structure on financial performance.

H_1-There is a negative relationship between Debt Equity Ratio and Profitability Ratios (ROE, ROA, Net Profit Margin)

H_2-There is a positive relationship between Debt Ratio and Profitability Ratios (ROE, ROA, Net Profit Margin)

H_3-There is a positive relationship between Equity Ratio and Profitability Ratios (ROE, ROA, Net Profit Margin)

H_4-Capital Structure has a significant relationship with the financial performance of pharmaceutical companies.

Model specification

Multiple linear regression is used to estimate how strong the relationship is between capital structure ratios such as Debt Equity Ratio, Debt Ratio, Equity Ratio, and profitability ratios such as ROE, ROA, and Net Profit Margin, which measures the financial performance of the pharmaceutical companies. Three of the regression models are formulated to check the relationship between capital structures and financial performance of the pharmaceutical companies, which forms the following equations:

$ROE=\beta_0+\beta_1$ (Debt. Equity. Ratio)$+\beta_2$(debt. Ratio)$+\beta 3$ (Equity. Ratio)$+\varepsilon$

$ROA=\beta_0+\beta_1$ (Debt. Equity. Ratio)$+\beta_2$ (debt. Ratio)$+\beta 3$(Equity. Ratio)$+\varepsilon$

Net Profit Margin$=\beta 0+\beta 1$ (Debt. Equity. Ratio)$+\beta 2$ (debt. Ratio)$+\beta 3$ (Equity. Ratio)$+\varepsilon$

Where: ROE, ROA and Net ProfitMargin are dependent variables

Debt. Equity. Ratio, Debt. Ratio, Equity. Ratios are independent variables.

$\beta 0$-Intercept term; ε – Error terms.

Results and Discussion

Data analysis and interpretations

Descriptive statistics of the data: Table 2 shows the maximum, minimum, mean, median and standard deviation of each capital structure (Debt Equity Ratio, Debt Ratio, Equity Ratio) and financial performance variables (ROE,ROA, Net Profit Margin).

$\beta 1$, β_2 and β_3 are the coefficients of the independent variables.

As described in Table 2, the first and second row of the table shows the respective maximum and minimum values of each listed pharmaceutical companies' capital structure and profitability ratios. The third and fourth row gives the average of each variable and median of the given variables defined as the middle value of data when arranged in ascending or descending order. The fifth row explains each variable's variability from their corresponding mean value (i.e., Standard Deviation).

Correlation analysis: Correlation Analysis is used to evaluate the strength of the relationship between capital structure and profitability ratios. It also defines the dependence of one variable upon another.

As described in Figure 1 the diagonal elements, which are the correlations of the variables with themselves, are always equal to one. Moreover, the relationship between debt-equity ratio and ROE, ROA, Net Profit Margin is negatively correlated since the correlation coefficient values of debt-equity ratio and ROE is -0.14, debt-equity ratio and ROA is -0.47, debt-equity ratio and Net Profit Margin is -0.45. The relationship between debt ratio and ROE, ROA, Net Profit Margin is also negatively correlated since the correlation coefficient values of debt-equity ratio and ROE is -0.21, debt-equity ratio and ROA is -0.51, debt-equity ratio and Net Profit Margin is -0.49. Moreover, the relationship between equity ratio and ROE, ROA, Net Profit Margin is positively correlated since the correlation coefficient values of debt-equity ratio and ROE is 0.2, debt-equity ratio and ROA is 0.62, debt-equity ratio and Net Profit Margin is 0.64.

Hypothesis H_1 is being accepted (fail to reject) because it negatively correlates debt-equity and profitability ratios. Also, Hypothesis H_3 is being accepted (fail to reject) because it gives a positive relationship between the equity and profitability ratios. Hypothesis H_2 is rejected because it gives a negative relationship between debt ratio and the profitability ratios (ROE, ROA, Net Profit Margin).

Regression analysis: Regression Analysis is used to find thestatistical impact of capital structure onfinancial performance.

Regression analysis of ROE and capital structures (debt-equity ratio, debt ratio,and equity ratio): The Linear regression equation of ROE describes the impact of capital structures on financial performance (ROE)

ROE=12.30864+74.85767(Debt.Equity.Ratio)-191.95523(Debt. Ratio)+13.91713(Equity.Ratio)

From the regression results, we observe that the debt-equity ratio positively affects ROE because when the debt-equity ratio increases by unit 1, the ROE increases by 74.85767 units holding all other variables constant. The debt ratio has a negative effect on ROE; due to the increase in the debt-equity ratio by unit 1, the ROE decreases by 191.95523 units holding all other variables constant. The equity ratio positively affects ROE; when the equity ratio increases by unit 1, ROE increases by 13.9171 units holding all other variables constant. Based on the results, to increase financial performance (ROE), it is necessary to reduce the debt ratio's coefficient and increase the debt-equity ratio and the equity ratio.

Regression analysis of ROA and capital structures (debt-equity ratio, debt ratio,and equity ratio): The Linear regression equation of ROA describes the impact of capital structures on financial performance (ROA)

ROA=-4.639747+41.206368(Debt.Equity.Ratio)-103.998053(Debt. Ratio)+28.388981(Equity.Ratio)

From the regression results, we observe that the debt-equity ratio positively affects ROE because when the debt-equity ratio increases by unit 1, the ROA increases by 41.206368 units holding all other variables constant. The debt ratio has a negative effect on ROE; due to the increase in the debt-equity ratio by unit 1, the ROA decreases by 103.998053 units holding all other variables constant. The equity ratio positively affects ROE; when the equity ratio increases by unit 1, ROA increases by28.388981 units holding all other variables constant. Based on the results, to increase financial performance (ROA), it is necessary to reduce the debt ratio's coefficient and increase the debt-equity ratio and the equity ratio.

Regression analysis of net profit margin and capital structures (debt-equity ratio, debt ratio, and equityratio): The Linear regression equation of Net Profit Margin describes the impact of capital structures on financial performance(Net Profit Margin)

Net Profit Margin=4.639747+45.034588 (Debt.Equity.Ratio) 109.513172 (Debt.Ratio)+32.685449(Equity. Ratio)

From the regression results, we observe that the debt-equity ratio positively affects ROE because when the debt-equity ratio increases by unit 1, the ROA increases by 45.034588 units holding all other variablesconstant. The debt ratio has a negative effect on ROE due to the increase in the debt-equity ratio by unit 1, and the ROA decreases by 109.513172 units holding all other variables constant. The equity ratio has a positive effect on ROE; when the equity ratio increases by unit 1, ROA increases by 32.685449 units holding all other variables constant. Based on the results, to increase financial performance (Net Profit Margin), it is necessary to reduce the debt ratio's coefficient and increase the debt-equity ratio and the equity ratio.

Following the hypothesis, H_4 is evaluated in three of the generated regression models.

H_4-Capital Structure has a significant relationship with the financial performance of pharmaceutical companies.

	ROE	ROA	Net profit margin	Debt equity ratio	Debt ratio	Equity ratio
Maximum	34.66	24.04	29.02	0.8663	0.3429	0.8607
Minimum	8.66	4.76	6.61	0.0003	0.0002	0.3551
Mean	18.18	10.614	13.36	0.23156	0.10115	0.5718
Median	16.59	8.36	11.96	0.12025	0.07	0.6063
Standard Deviation	7.33854	5.85841	6.07153	0.26748	0.10274	0.14292

Table 2. Descriptive statistics.

Dependent variable	R-square	P-value
ROE	23.40%	0.2213>0.05
ROA	47.40%	0.0140<0.05
Net profit margin	50.60%	0.0088<0.05

Table 3. Regression table.

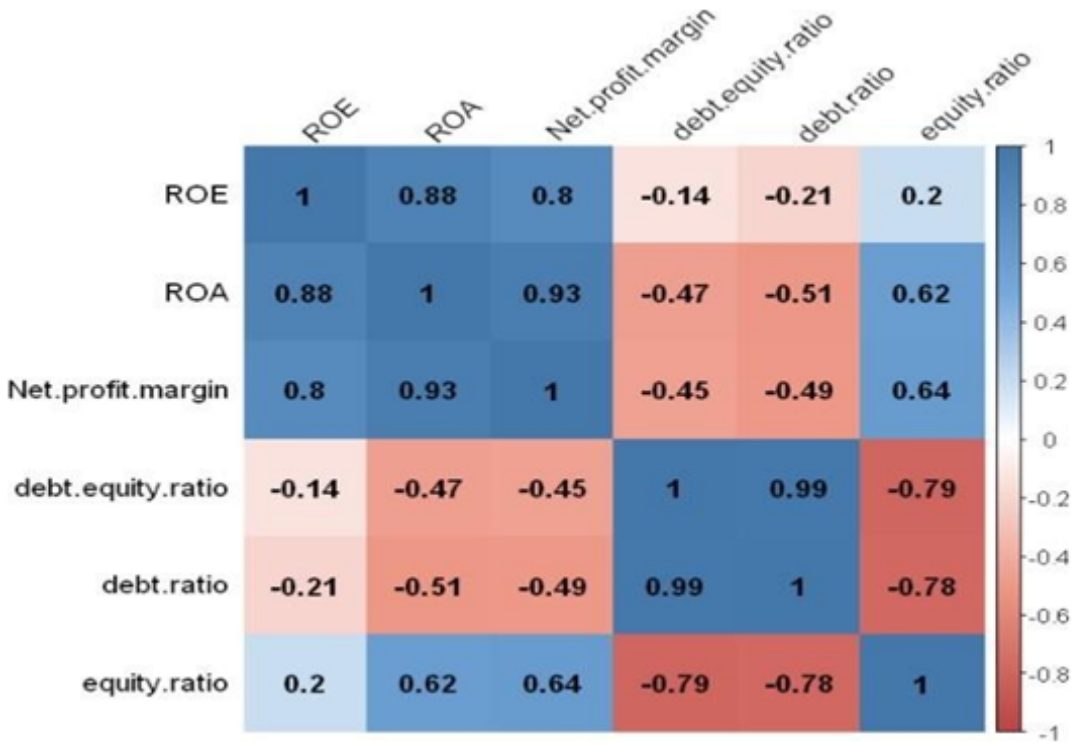

Figure 1. Correlation matrix.

The P-value evaluates whether the independent variables have the statisticallysignificant predictive capability.

As described in Table 3, the first model with ROE as the dependent variable has a P-value of 0.2213, which is greater than 0.05(significance level). Hence, hypothesis H_4 is being rejected in the case of the first model. R^2 determines how close the data is being fitted in the regression line. The firstmodel has an R^2 of 23.44%. It describes, 23.44% of the variation in ROE is caused by the variation in the independent variables such as debt-equity ratio, debtratio, and equity ratio. Other variables might cause the remaining 76.56% of the variation in ROE (Table 3).

The second model with ROA as the dependent variable has a p-value of 0.014, which is less than 0.05(significance level). Hence, hypothesis H_4 has been failed to reject (accepted) and are more statistically significant. It has an R^2 of 47.49% that describes 47.49% of the variation in ROA is caused by the variation in theindependent variables such as debt-equity ratio, debt ratio, and equity ratio. Other variables might cause the remaining 52.51% of the variation in ROA. The third model with Net Profit Margin as a dependent variable has a p-value of 0.00882, which is less than the significance level (0.05). Hence, hypothesis H_4 has been failed to reject (accepted) and are more statistically significant. It has an R^2 of 50.63%, which describes, 50.63% of the variation in Net Profit Margin is caused by the variation in the independent variables such as debt-equity ratio, debt ratio, and equity ratio. Other variables might cause the remaining 49.37% of the variation in Net Profit Margin.

Findings and Conclusion

Correlation analysis shows a negative relationship between capital structure as reflected in Debt Equity Ratio, Debt Ratio, and financial performance as reflected in the Profitability Ratios (ROE, ROA, Net Profit Margin). Further, the analysis showsa positive relationship between Equity Ratio (Capital structure) and Profitability Ratios (ROE, ROA, Net Profit Margin). So, hypothesis H_1 and H_3 are accepted, i.e., failed to reject, and H_2 has been rejected. The first regression analysis model showed that each of the capital structures is not statistically influenced by ROE as profitability ratio, which is a cause of the pharmaceutical companies' financial performance. The second and third model shows that each of the capital structures is statistically influenced by ROA and Net Profit Margin as profitability ratio, which is also a measure of the listed pharmaceutical companies' financial performance. So, hypothesis H_4 is rejected in the case of the first model and accepted (failed to reject) in the second and third regression models.

Measuring growth and profitability is one of the primary goals of a business entity. The study's principal objective was to measure the impact of capital structure on selected pharmaceutical companies' financial performance. This study indicatesthat the composition of debt and equity in afirm's capital structure is a significant managerial decision. It can impact the firm's performance, and it can also influence the shareholder's interest.

References

1. Basit, Abdul and Zubair Hassan. "Impact of Capital Structure on Firms Performance: A Study on KarachiStock Exchange (KSE) Listed Firms in Pakistan." *Int J Mgmt Acct, Econ* 4(2017): 118-135.
2. Bhatnagar, Vinod. "Effect of Change in Capital Structure on the Profitability of FMCG Sector Companies." Agra: Golden Valley Publication, January, (2016).
3. Das, Chandrika Prasad and Rabindra Kumar Swain. "Influence of Capital Structure on Financial Performance." *Parikalpana KIIT J Mgmt* 14(2018): 161-171.
4. Goyal, A. "Impact of Capital Structure on Performance of ListedPublic Sector Banks in India." *Int J Bus Mgmt Invent* 2(2013): 35-43.
5. Jawade, Avinash. "Capital Structure and its Impacton Profitability: An Empirical Study for Pharmaceutical Companies with Special Reference to their Market Capitalization." *J Res Commer Mgmt* 3(2014): 20-28.
6. Movalia, Nilesh. "A Study on CapitalStructure Analysis and Profitabilityof Indian Tyres Industry." *Pacific Bus Rev Int* 8(2015): 78-82.
7. Ahmad, Nawaz, Atif Salman and Aamir Firoz Shamsi. "Impact of Financial Leverage on Firms' Profitability: An Investigation fromCement

Sector of Pakistan." *Res J FinancAcct* 6(2015): 75-80.

8. Nirajini, A and Priya KB "Impact of Capital Structure on Financial Performance of the Listed Trading Companies in Sri Lanka." *Intl J Scientific Res* 3(2013): 459-467.
9. Mumtaz, Raheel and Shahnaz A. "Capital Structure and Financial Performance: Evidence from Pakistan (Kse 100 Index)." *J Basic Appl Scientific Res* 3(2013): 113-119.
10. Taani, Khalaf. "The Relationship between Capital Structure and Firm Performance: Evidence from Jordan." *J Financ Acct* 2(11): 542-546.

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