

RESEARCH PAPER

Capital Structure Impact on Firm Performance: An Empirical Study of the Pharmaceutical Sector in India

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ABSTRACT

The paper seeks to study the impact of capital structure on the profitability of the top twenty pharmaceutical companies based on market capitalization. Only companies listed on the National Stock Exchange (NSE) were selected for the analysis purposes. In this study, we collected five years (2018-2022) data for the empirical investigation using panel data regression analysis. Four dependent variables (return on equity, return on assets, earning per share, and Tobin's Q) and three independent variables (long-term debt ratio, short-term debt ratio and total debt ratios) were selected to measure financial performance and capital structure, respectively. Size is a control variable. The results indicated that firm performance, which was measured by return on asset, return on equity, and earnings per share, has a significant negative relationship with short-term debt ratio, long-term debt ratio, and total debt ratio. Tobin's Q showed no relationship with short-term debt and long-term debt. The paper adds to the emerging body of literature on capital structure and financial performance relationship in the Indian context using a newer data set.

HIGHLIGHTS

- This study provides insights into the impact of capital structure on the profitability of pharmaceutical companies listed on the National Stock Exchange (NSE).
- The result showed that variables had a significant negative relationship.

Keywords: Capital structure, financial performance, NSE, panel regression analysis, tobin's Q

The Growth of any company directly depends on strong financial backgrounds. Capital structure plays a major role in the financial management of a company (Al-Janadi, 2021). It refers to the way a company finances its operations through a combination of equity (shares) and debt (loans, bonds, etc.) (Etale and Uzakah, 2019). The capital structure decision involves determining the proportion of debt and equity that a company will use to fund its activities. The importance of capital structure lies in its impact on a company's financial health and value (Cerpentier *et al.* 2022). The capital structure affects the company's overall cost of capital, which is the weighted average cost

of debt and equity. Debt generally has a lower cost than equity, as interest on debt is tax-deductible. By choosing an optimal mix of debt and equity, a company can minimize its overall cost of capital and maximize shareholder value (Kurniasih and Rustam, 2022). Capital structure also influences the risk and return profile of a company. Debt financing introduces financial leverage, which can magnify returns for shareholders when the company

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performs well. However, it also increases the risk because interest payments and principal repayment obligations must be met regardless of the company's performance (Zhou *et al.* 2021). When evaluating its value and investment potential, investors often consider a company's capital structure. A well-balanced capital structure can signal financial stability, efficient use of capital, and the ability to generate consistent cash flows (Mansour *et al.* 2022). The capital structure decisions of a company can affect its credit rating, stock price, and access to capital markets. Capital structure is essential for a company's long-term success and sustainability (Aksoy *et al.* 2020).

Pharmaceutical industries play a major role in the Indian economy and have significant economic importance. Currently, the pharmaceutical industry makes up about 1.72% of the nation's GDP. The Indian pharmaceutical market is expected to reach 65 billion dollars by 2024 and to 130 billion dollars by 2030 (Priyadarshi *et al.* 2023). Over the past three years, the pharmaceutical business has shown remarkable growth. India's pharmaceutical market is now worth 50 billion dollar. The Indian pharmaceutical industry provides more than 60% of the world vaccine demand, 40% of generic drugs demand in the US, 25% of all medicine in the UK, and exports around 24-billion-dollar worth of medicines worldwide (Jha, and Sharma, 2020). The capital structure of a company has a significant impact on its long-term financial management and profitability. The Indian pharmaceutical companies are a key player in the international pharmaceutical market. Positive company performance, industry growth potential, positive market sentiment, and technological advancements of company contribute to an increase in customer interest for share buying (Moro *et al.* 2020). This paper examines the impact of capital structure on the financial performance of pharmaceutical companies in India.

LITERATURE REVIEW

Company performance has become an important topic in strategic management research, and it was generally taken as a dependent variable. There are number of research findings on the firm performance analysis. The relationship between firm value and capital structure has been an important topic of discussion.

Minh and Dung (2015) conducted a study of various factors influencing the capital structure of Vietnam's real estate businesses based on data from 47 listed firms on HOSE and HNX during 2008–2013 and observed that growth rate is positively correlated with the leverage ratio. Contrarily, it has been demonstrated that profitability and risk have detrimental effects on a company's debt ratio, whereas a company's size, physical assets, and liquidity do not influence the leverage ratio.

Qudah (2017) examined the relationships between financial performance and capital structure of the companies listed on the Abu Dhabi Securities Exchange (ADX) from 2008 to 2015. The research findings demonstrated a substantial correlation between listed firms' financial performance and capital structure on the ADX.

Hung and Cuong (2020) studied the impact of capital structure on pharmaceutical companies' performance in the stock market of Vietnam's. Return on Equity (ROE) is used as the dependent variable in the study, and four independent variables are taken, including long-term assets, self-financing, debt-to-asset ratio, and financial leverage. The impact of the capital structure on the firm's performance is examined by using the least square regression method. The findings showed a positive correlation between the financial leverage ratio, long-term asset ratio, and debt-to-assets ratio and a negative correlation between self-financing and returned on equity.

Tretiakova *et al.* (2021) studied UK pharmaceutical industry performance and evaluated the interactions between the capital structure of the firm and the key performance indicators of Return on Asset (ROA), Return on Invested Capital (ROIC), Change in Market Capitalization, and Price-to-Book Ratio. The effect of the capital structure on financial measures of the firm's performance was examined using the Wald test and the panel data regression method. Findings of the study suggested that long-term debt has a positive link with the price-to-book ratio and changes in market capitalization, whereas equity has a negative impact on the price-to-book ratio and Return on Asset.

So, as an outcome of all of these findings, it can be suggested that there is a mixed interaction between capital structure and pharmaceutical company performance on a national and global scale.

Finally, we can conclude that the effect of capital structure on firm performance varies from industry to industry. After studying all these reviews, it is found that there is no previous research in our country, specifically in the pharmaceuticals industry in the current time period.

METHODOLOGY

Data

Based on market capitalization, our sample consists of 20 pharmaceutical companies listed on the National Stock Exchange (NSE). The information utilized for the estimation came from the annual reports for the years 2018–19 through 2022–23.

The data for the sample companies came from Prowess, a database maintained by the Centre for Monitoring Indian Economy (CMIE), and annual financial standalone data were used. Leading provider of business information, CMIE was founded in 1976. Through paid subscriptions, it offers financial performance time series data of Indian enterprises, and its database is continually updated. The primary basis of this information is the annual reports of specific corporations.

To analyze data, SPSS statistical software has been used for applying the required statistical analysis techniques like the panel data fixed effect regression model. The panel regression model approach was used to analyze and compare the relationship between financial performance and capital structure. In this study, three measures of financial performance have been used—ROA, ROE, EPS, and Tobin's Q. Three measures of capital structure have been used- long-term debt ratio, short-term debt ratio, and total debt ratio. Fig. 1 shows the dependent and independent variables used for the analysis purpose.

Dependent variables	Independent variables
• Return on asset (ROA) • Return on equity (ROE) • Earning per share (EPS) • Tobin's Q (Q Ratio)	• Long term debt Ratio (LTDR) • Short term debt Ratio (STDR) • Total Debt Ratio (TDR)

Fig. 1: Conceptual framework of the study

Theoretical Framework

The following regression models tested the relationship between financial performance and capital structure. The alternative hypothesis (H_1) was that there is a significant relationship between financial performance (ROA, ROE, EPS, and Tobin's Q) and capital structure (long-term debt ratio, short-term debt ratio, and total debt ratio) of pharmaceutical companies.

Table 1 shows that the four regression equations were developed using the panel data fixed effect approach.

Table 1: Regression Equations

$ROA_{nt} (Performance) = C_n + b(LTDR)_{nt} + b_1(STDR)_{nt} + b_2(TDR)_{nt} + U_{nt}$
$ROE_{nt} (Performance) = C_n + b(LTDR)_{nt} + b_1(STDR)_{nt} + b_2(TDR)_{nt} + U_{nt}$
$EPS_{nt} (Performance) = C_n + b(LTDR)_{nt} + b_1(STDR)_{nt} + b_2(TDR)_{nt} + U_{nt}$
$Tobin's\ Q_{nt} (Performance) = C_n + b(LTDR)_{nt} + b_1(STDR)_{nt} + b_2(TDR)_{nt} + U_{nt}$

Source: CMIE Prowess.

Note: C = Constant, U = residual component, $n = 1, \dots, 422$ and $t = 1, \dots, 10$.

RESULTS AND DISCUSSION

Table 2 summarizes descriptive statistics of dependent and independent variables of selected

Table 2: Descriptive Statistics

Descriptive statistics	ROA	ROE	EPS	Tobin's Q	LTDR	STDR	TDR
Mean	1.58	1.49	7.95	0.52	0.02	0.02	0.11
Standard Deviation	6.14	5.79	30.79	2.01	0.06	0.08	0.44
Kurtosis	(0.30)	(0.41)	1.08	(0.26)	1.99	0.51	(1.62)
Skewness	0.04	0.64	1.08	0.82	1.68	1.24	0.58

pharmaceutical companies. Descriptive statistics shows the mean, median, SD, kurtosis, and skewness of the data. The mean of ROA, ROE, EPS, and Tobin's Q are 1.58, 1.49, 7.95, and 0.52, respectively. The mean capital structure shows that LTDR, STDR, and TDR are 20 %, 20 %, and 11%, respectively. It shows that pharmaceutical companies finance only 11 % of capital using debt sources. This indicates that the selected companies are less risky in nature.

Table 3 represents the correlation between all the independent variables considered under study. It was found that there is no high degree of correlation between any of the above independent variables; hence, the regression models are free from the problem of multicollinearity.

Table 3: Correlation matrix of independent variables

	LTDR	STDR	TDR
LTDR	1		
STDR	0.495473	1	
TDR	-0.36011	-0.14054	1

Regression results

Table 4 shows the adjusted value of the R square (0.73), which indicates that the independent variables (LTDR, STDR, and TDR) are responsible for 73% of the fluctuations in the dependent variable (ROA). The value of the F statistic is 13.74, which is significant at a 0.05 level. Long-term debt, short-term debt, and total debt has a significant negative correlation with the ROA, which indicates that a higher level of leverage results in a lower level of ROA. The main reason for the negative relationship was because of less debt in the capital structure.

Table 4: Estimation results when performance measured by ROA- Model 1

Independent variables	Coefficients	Standard Error	t Stat	P-value
Intercept	2.7	2.1	10.8	0.0
LTDR	-0.5	6.7	-2.1	0.1
STDR	-0.4	1.6	-4.2	0.0
TDR	-0.0	2.1	-2.9	0.0
Adjusted R ²	0.73			
F statistics	13.74			
Prob. (F statistics)	0.00			

Table 5 shows the adjusted value of the R square (0.72), which indicates that the independent variables (LTDR, STDR, and TDR) are responsible for 72% of the fluctuations in the dependent variable (ROE). The value of the F statistic is 9.54, which is significant at a 0.05 level, and total debt have significant negative correlation. Long-term debt, short-term debt, and total debt have a significant negative correlation. Long-term debt, short-term debt, and total debt have a significant negative correlation with the ROE. The results indicate that higher debts lead to low levels of dividends to the equity shareholders.

Table 5: Estimation results when performance measured by ROE- Model 2

Independent variables	Coefficients	Standard Error	t Stat	P-value
Intercept	3.2	2.3	10.2	0.0
LTDR	-0.2	1.1	-3.2	0.0
STDR	-1.0	1.6	-1.4	0.2
TDR	-0.9	2.3	-3.9	0.0
Adjusted R ²	0.72			
F statistics	9.54			
Prob. (F-statistics)	0.00			

Table 6 shows the adjusted value of the R square (0.62), which indicates that the independent variables (LTDR, STDR and TDR) is responsible for 62% of the fluctuations in the dependent variable (EPS). The value of F statistic is 10.88 that is significant at 0.05 level. Long term debt, short term debt and total debt also have significant negative correlation with the EPS. The results indicate that higher debts lead to fewer earnings to the equity shareholders.

Table 6: Estimation results when performance measured by EPS- Model 3

Independent variables	Coefficients	Standard Error	t Stat	P-value
Intercept	5.5	11.6	8.3	0.0
LTDR	-1.2	1.5	-2.2	0.1
STDR	-0.4	3.8	-3.1	0.0
TDR	-0.0	1.4	-3.5	0.0
Adjusted R ²	0.67			
F statistics	10.88			
Prob. (F statistics)	0.00			

Table 7 shows the adjusted value of the R square (0.80), which indicates that the independent variables (LTDR, STDR and TDR) is responsible for 80% of the fluctuations in the dependent variable (Tobin's Q). The value of F statistic is 19.91 that is significant at 0.05 level. Long term debt, short term debt and total debt have no significant correlation with the Tobin's Q.

Table 7: Estimation results when performance measured by Tobin's Q - Model 4

Independent variables	Coefficients	Standard Error	t Stat	P-value
Intercept	-0.2	0.6	-0.4	0.7
LTDR	4.4	4.7	0.9	0.0
STDR	0.6	3.3	0.2	0.4
TDR	4.4	0.6	7.5	0.0
Adjusted R ²	0.80			
F statistics	19.91			
Prob. (F statistics)	0.00			

CONCLUSION

Debt ratios are negative and significantly correlated with the ROE, ROA, and EPS and support the concept of agency theory for the Indian pharmaceuticals' companies. Tobin's Q has no relationship with the capital structure of the companies. The above analysis indicates that total debt has a negative significant impact on financial performance. This negative relationship suggests that these financial metrics tend to decrease as the total debt ratio increases. The conclusion drawn from this research paper is that higher levels of debt, as indicated by a higher total debt ratio, have a detrimental impact on a company's financial performance, as reflected in ROE, ROA, and EPS. It implies that excessive debt can hinder a company's ability to generate profits, allocate resources efficiently, and generate earnings for shareholders. The firms should also use more equity to maximize their financial performance in such a way that it yields growth opportunities. In summary, a company's capital structure plays a crucial role in its financial performance. Policymakers must understand this relationship to ensure economic stability, while managers must make strategic financing decisions to optimize financial performance and shareholder value.

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