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OPTIMISING CAPITAL STRUCTURE FOR FINANCIAL PERFORMANCE: INSIGHTS FROM THE PHARMACEUTICAL INDUSTRY IN INDIA

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Abstract *This comprehensive research explores the intricate relationship between capital structure and financial performance in the pharmaceutical industry. The study reveals that while debt financing offers tax advantages, excessive debt can compromise a firm's financial health. Through regression analysis, it is found that the equity component positively influences financial metrics such as Return on Equity (ROE), Return on Assets (ROA), and Return on Capital Employed (ROCE). Conversely, both long-term and short-term debt components exhibit adverse effects on these financial indicators. The study underscores the importance of maintaining a balanced capital structure, prioritising equity financing, and cautiously considering long-term debt over short-term debt. Findings suggest that pharmaceutical firms should prioritise equity and long-term debt while minimising short-term debt to optimise financial performance. Ultimately, prudent capital structure decisions are vital for firms seeking sustainable growth and competitiveness in the pharmaceutical sector.*

Keywords: *Capital Structure, Return on Equity (ROE), Return on Assets (ROA), Return on Capital Employed (ROCE), Pharmaceutical Sector*

INTRODUCTION

A burgeoning enterprise inevitably requires significant capital resources to establish itself and initiate the production of goods and services. These funds are essential for procuring raw materials, converting them into work-in-progress inventory, and ultimately manufacturing finished goods. Additionally, financial resources are indispensable for marketing, advertising, and customer acquisition efforts. Furthermore, as the firm expands within its industry or ventures into related or unrelated sectors, additional capital becomes required to support its growth. Balancing the acquisition of monetary resources from various available avenues is crucial, demanding careful consideration and prudence from both the management and the founders.

Optimising Capital Structure for Firm Value Maximisation

In navigating the financial landscape, firms rely on two primary sources of capital: debt and equity. The balance between these elements, known as the capital structure, profoundly influences a firm's growth and profitability trajectory. Debt, with its tax advantages, enhances profit efficiency, underscoring the critical link between capital structure and company profitability. Yet, capital structure decisions, as a cornerstone of corporate finance, pose significant challenges, impacting a firm's financial health and long-term viability. Such decisions, reflecting the mix of debt and equity, are pivotal for firms seeking optimal financial performance. Managers must carefully weigh the trade-offs, as different levels of debt and equity can influence overall market value. However, manager's decisions may not always align with value maximisation, as personal interests often come into play. Agency conflicts, prevalent in closely held companies, can lead to suboptimal capital structures, emphasising the need for firms to overcome internal challenges and prioritise market value maximisation.

Understanding the nuances of capital structure decisions requires recognising their profound impact on a firm survival and success. Extensive research, inspired by Modigliani and Miller's seminal work, delves into the intricate relationship between capital structure and financial health. The

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complexity lies in assessing how financing choices affect firm performance, underscoring the importance of informed decision-making.

Strategic Capital Structure: Navigating Debt, Equity, and Financial Performance

In the intricate landscape of corporate finance, firms strategically navigate two primary sources of funding: debt and equity. Debt, typically represented by bond offerings or long-term notes payable, involves borrowing capital with a contractual obligation to repay it over time. Equity encompasses common and preferred stocks, along with retained earnings that are reinvested into the business. Understanding the dynamics of debt and equity is crucial for optimising a firm's capital structure and maximising its market value.

Debt capital, acquired through loans, offers fixed returns to lenders and can include both short-term and long-term obligations. Leverage, or the inclusion of debt, varies based on factors such as the asset base, investment opportunities, and business size, while also being influenced by market volatility, profitability, and product uniqueness. Equity financing, on the other hand, involves raising funds from investors in exchange for ownership stakes. Equity investors exert influence through corporate governance mechanisms, such as board representation, and share in the company's success through appreciation.

Short-term debt addresses immediate financing needs and is typically repaid within a year, offering flexibility and lower costs. In contrast, long-term debt extends beyond a year and requires careful consideration due to its impact on the firm's financial obligations. Moreover, equity financing empowers investors with direct control and can enhance shareholder value, which, in turn, contributing to improved financial performance.

Shareholders gauge a firm's financial performance based on wealth accumulation over time, measured through financial ratios and stock market performance. The link between a firm's capital structure decisions and its financial health is central to assessing performance and ensuring long-term viability. However, managerial discretion in capital structure decisions does not always align with shareholder value maximisation, underscoring the need for prudent decision-making and corporate governance.

Balancing the trade-offs between debt and equity is essential for firms to maintain financial stability and maximise value. Strategic capital structure decisions, informed by a thorough understanding of debt-equity dynamics, are critical for navigating the complexities of corporate finance and achieving long-term success. Thus, the study of capital structure emerges as a cornerstone of corporate finance, guiding firms in their quest for financial optimisation and sustainable growth.

Global Pharmaceutical Industry

The pharmaceutical industry, valued at USD 405.52 billion in 2020, remains resilient amid the COVID-19 pandemic, with an expected growth rate of 11.34% from 2021 to 2028. While new entrants face barriers due to high R&D costs and customer loyalty, existing companies confront fierce competition. Leading firms like Pfizer, AstraZeneca, and Sanofi have utilised debt to meet funding needs, maintaining varying debt-to-equity ratios. Pfizer's ratio fluctuated, notably peaking at 80% in 2020 due to COVID-19 vaccine production. AstraZeneca aims to reduce its high debt ratio, while Sanofi opts for minimal debt to mitigate financial risk. Analysing these trends reveals the complexity of determining an ideal debt-ro-equity split, highlighting the need for tailored strategies to maximise firm value. Conducting further research to understand unique contextual factors is imperative for informed decision-making within the pharmaceutical sector.

Indian Pharmaceutical Industry

India ranks third globally in generic drug exports and leads in vaccine production, accounting for over half of the global output. Major pharmaceutical hubs include Ahmedabad, Vadodara, Kolkata, Hyderabad, Bangalore, and Pune, with key players like Sun Pharma and Cipla. The industry demands substantial investment in R&D for infection treatment, posing challenges in financial allocation. Given contrasting views on debt and equity trade-offs, firms must make informed decisions to optimise capital structure and enhance market value as well as financial performance. This underscores the crucial role of pharmaceutical enterprises in meeting global healthcare needs and emphasises the importance of strategic financial management.

Major Expenses of the Pharma Industry

Research and development, marketing, and regulatory compliance constitute significant expenses for pharmaceutical firms. Although a typical pharmaceutical company spends more than 25% of its revenue on R&D, other companies may at times spend far more. Data from the year 2020 shows that the amounts spent by the leading pharmaceutical companies on research and development of new drugs: Johnson & Johnson (Revenue: $82.6 billion, R&D: $12.2 billion), Roche (Revenue: $26.9 billion, R&D: $6.5 billion), Novartis (Revenue: $48.7 billion, R&D: $9.0 billion), Merck (Revenue: $48 billion, R&D: $13.6 billion), AstraZeneca (Revenue: $26.6 billion, R&D: $6.0 million) and Pfizer (Revenue: $41.9 billion, R&D: $9.4 billion). Balancing these expenses requires prudent capital structure decisions to sustain growth and competitiveness.

In summary, navigating the complexities of capital structure decisions is crucial for firms across industries, including pharmaceuticals, to achieve financial stability, growth, and competitiveness.

LITERATURE REVIEW

The literature extensively explores the relationship between capital structure and the performance of publicly traded companies, providing valuable insights for entrepreneurs, policymakers, and financial managers. This research aims to optimise decisions regarding the mix of debt and equity capital in capital structure planning, ultimately maximising shareholder wealth. The majority of studies on this topic focus on large, publicly traded firms in industrialised nations, providing a foundation for understanding capital structures, albeit with limitations due to institutional variations across countries (Booth et al., 2001).

Modigliani and Miller's seminal work in 1958 initiated the development of capital structure theory, highlighting scenarios where capital structure is significant and others where it is not (Modigliani & Miller, 1958). In the context of the pharmaceutical sector, capital structure plays a crucial role in determining a company's ability to finance costly R&D projects, navigate regulatory environments, and invest in market expansion. Over the years, various theories have emerged to explain the optimal capital structure, including the trade-off theory, which balances the benefits of debt financing (such as tax shields) against the potential costs (such as financial distress) (Van Horne, 1993; Hampton, 1998). The Pecking Order Theory suggests that firms prefer internal financing over external financing and resort to debt issuance only when internal funds are insufficient (Myers, 2001).

Financial performance, measured by metrics like profitability and liquidity, is crucial for evaluating a firm's historical and current condition (Erasmus, 2008). Studies have shown that more efficient firms tend to achieve higher returns and can adjust their capital structure accordingly (Berger & Di Patti, 2006). Moreover, differences in institutional settings influence capital structure decisions, as observed in developing countries where firms rely more on debt financing for expansion (Singh & Hamid, 1992; Abor, 2005). However, pharmaceutical companies also face significant risks, such as patent expiration, regulatory hurdles, and market competition, which complicate capital structure decisions (Abor, 2005). Research has shown that in the pharmaceutical industry, firms often rely on debt financing to leverage growth opportunities while balancing the high risks associated with drug development and regulatory approvals (Chakraborty & Soni, 2017).

The relationship between debt and profitability has been a subject of debate. While some studies indicate a positive correlation between debt and profitability (Taub, 1975; Roden & Lewellen, 1995), others suggest a negative impact (Fama & French, 1998; Hammes, 1998). Factors such as industry, country-specific regulations, and firm characteristics play significant roles in determining this relationship (Ebaid, 2009; Weinraub & Visscher, 1998). In emerging markets, pharmaceutical firms may also face additional challenges, including limited access to financing and an over-reliance on debt financing due to weaker capital markets (Singh & Hamid, 1992).

Theoretical frameworks like the trade-off theory and the Pecking Order Theory offer insights into how firms decide on their capital structure (Watson & Wilson, 2002). Agency Theory emphasises the role of debt in mitigating agency conflicts between managers and shareholders (Jensen & Meckling, 1976), while empirical evidence suggests that excessive debt can lead to agency problems (Fama & French, 2000). Ultimately, firms aim to strike a balance between the benefits and costs of debt financing to maximise value (Champion, 1999). This is particularly relevant in the pharmaceutical sector, where debt financing decisions can significantly impact R&D strategies, firm risk profiles, and overall corporate governance (Chaudhuri, 2021).

Furthermore, research has shown that pharmaceutical firms with substantial R&D expenditures tend to utilise equity financing more heavily, as this reduces the pressure of fixed debt payments and allows for greater flexibility in funding long-term research projects (Ghosh & Chakrabarty, 2020). Pharmaceutical companies with higher levels of debt, on the other hand, may benefit from the tax advantages of debt, but they also face greater risks related to financial distress, especially in the event of regulatory setbacks or market failures (Kumar & Soni, 2020).

Ultimately, firms in the pharmaceutical sector must strike a delicate balance between debt and equity financing to maximise firm value while managing the risks associated with their unique business environment. Singh and Mishra (2018) found that capital structure decisions in pharmaceutical firms are influenced by firm size, R&D intensity, and profitability. Akinlo and Akinsola (2017) further argue that pharmaceutical companies in emerging markets face unique challenges in balancing the risks of debt with the need for capital to fund expensive and uncertain drug development processes.

In conclusion, the literature on capital structure and firm performance provides a comprehensive understanding of the factors influencing financing decisions and their implications for a company's value. While various theories offer insights into optimal capital structure choices, the relationship between debt and profitability remains nuanced and context-dependent. Future research should continue to explore these dynamics in different institutional settings to inform practical decision-making by firms and policymakers.

CONCEPTUAL FRAMEWORK

The proposed relationships to be analysed are briefed using the flow diagram (Fig. 1) below:

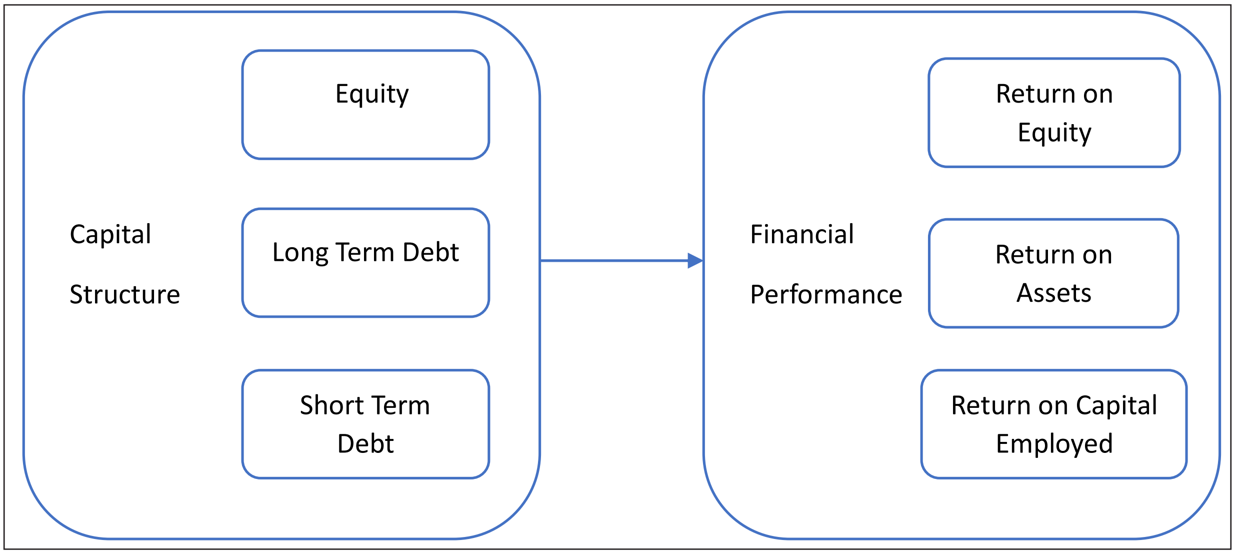

Fig. 1

The independent and dependent variables used in the study are Capital Structure and Financial Performance, which have been divided further into the following:

Capital Structure refers to how a company finances its operations and growth through a mix of equity and debt. It includes:

- *Component of Equity:* The portion of the company's capital contributed by shareholders, including common and preferred stock.
- *Component of Long-Term Debt:* The portion of the company's capital raised through borrowing with a maturity period exceeding one year.
- *Component of Short-Term Debt:* The portion of the company's capital raised through borrowing with a maturity period of one year or less.
- Financial Performance: These are measures that indicate how well a company is performing financially.
- *Return on Equity (ROE):* ROE is a measure of a company's profitability relative to the equity invested by shareholders (Table 1). It indicates how efficiently the company is using its equity to generate profits.
- *Return on Assets (ROA):* ROA measures a company's profitability relative to its total assets. It shows how effectively the company is utilising its assets to generate earnings.
- *Return on Capital Employed (ROCE):* ROCE evaluates the efficiency of a company's capital investments. It compares the company's operating profit to the capital employed, which includes shareholders' funds and long-term liabilities. ROCE indicates the profitability of the firm's overall capital investment.

Table 1: Measurement of Variables

Financial Performance	Measurement
Return on Assets (ROA)	Net Income/Total Assets
Return on Equity (ROE)	Net Income/Shareholders' Equity
Return on Capital Employed (ROCE)	EBIT or Operating Profit/Capital Employed

RESEARCH METHODOLOGY

This study encompassed data collected over a decade (2010 to 2019) from various pharmaceutical firms operating in

India. Regression analysis was conducted on variables measuring capital structure and financial performance using Microsoft Office 365. Statistical parameters such as p-values, t-stats, and R-squared values were examined to validate findings and assess the statistical significance of coefficients. The research adopted a purely quantitative approach. Initially, data collection was aimed at the top 50 pharmaceutical firms listed and traded on the Bombay Stock Exchange. Parameters included equity, long-term debt, short-term debt, return on equity, return on assets, and return on capital employed. Out of the 50 listed firms, 11 were established after 2010, lacking financial data for the entire study period. Firms with missing data points were excluded to maintain the sample integrity, resulting in 35 firms for analysis. The study relies solely on secondary data, excluding questionnaires or surveys. Financial data spanning ten years (2010-2019) were sourced primarily from annual reports on firms' official websites. In cases of missing data, reputable financial websites like MoneyControl.com were consulted. The COVID-19 pandemic, emerging in late 2019 and onwards, caused significant disruptions globally. As its impact varied across industries, data for 2020 and 2021 were excluded from this study due to the potential distortion of business metrics.

DATA ANALYSIS AND FINDINGS

The analysis started with descriptive statistics, which are represented in Table 2. The maximum equity component observed was 100%, indicating some firms operated without any debt (unlevered firms). The minimum equity component was 13%, suggesting significant equity dilution in some cases, such as that of Sequent Scientific Limited in 2014. The mean equity component was 81%, showing a strong preference for equity financing across the sample. The standard deviation of 20% indicates moderate variability in equity composition among the firms.

The maximum long-term debt component was 56%, with some firms not using long-term debt at all. The mean long-term debt component was 10%, indicating a relatively small portion of long-term debt in the capital structure. The standard deviation of 13% suggests moderate variability in long-term debt composition. The maximum short-term debt component was 80%, indicating significant short-term debt utilisation by some firms. The mean short-term debt component was 9%, indicating a lesser reliance on short-term debt. The standard deviation of 11% suggests moderate variability in short-term debt composition.

ROE ranged from -227.68% to 110.24%, with a mean of 15.81% and a standard deviation of 19.57%. Negative ROE, such as -227.68% for Sequent Scientific Limited in 2014, resulted from losses or excessive debt relative to net worth. ROA ranged from -29.24% to 98.10%, with a mean of 11.01% and a standard deviation of 10.46%. Negative ROA indicated loss-making operations. ROCE ranged from -89.31% to 105.41%, with a mean of 15.49% and a standard deviation of 14.30%. Negative ROCE indicated inefficient capital utilisation relative to earnings.

Table 2: Descriptive Statistics

Abbreviation		Maximum	Minimum	Mean	Std Devn
Equity Component (%)	EQ	1.00	0.13	0.81	0.20
Long-Term Debt Component (%)	LTD	0.56	0.00	0.10	0.13
Short-Term Debt Component (%)	STD	0.80	0.00	0.09	0.11
Return on Equity (%)	ROE	110.24	-227.68	15.81	19.57
Return on Assets (%)	ROA	98.10	-29.24	11.01	10.46
Return on Capital Employed (%)	ROCE	105.41	-89.31	15.49	14.30

The process of investigating the statistical connection between various research variables and their respective significance was conducted through regression analysis. The outcomes of the regression encompass three main components: model summary, ANOVA, and coefficient summary. These results were further categorised into three sub-sections, each focusing on one of the three dependent variables: Return on Equity (ROE), Return on Assets (ROA), and Return on Capital Employed (ROCE).

Before delving into the regression results, it's crucial to note a significant aspect. The components of equity, long-term debt, and short-term debt exhibit a high correlation due to their interdependent nature within the capital structure. As these components are not independent but rather sum up to 100% of the capital structure, multicollinearity arises. Multicollinearity occurs when predictor variables are highly correlated, complicating the analysis by obscuring the independent effect of each variable on the dependent variable. Addressing multicollinearity is essential before interpreting the results. In this study, since the components are integral to the analysis and cannot be eliminated or combined, the most appropriate technique in this case is to consider the variables (EQ, LTD, STD) one at a time, and analyse their impact on each of ROE, ROA and ROCE.

Return on Assets (ROA)

Equity Component: The regression analysis yielded a significant positive coefficient of 19.770 ($p<0.000$) for the equity component in predicting ROA (Table 3). This implies that for every 1% increase in the equity component of the firm's capital structure, ROA is expected to increase by 19.770. The R-squared value of 0.137 suggests that approximately 13.7% of the variability in ROA can be explained by changes in the equity component (Table 4).

The regression results lead to the following regression equation:

ROA = −5.081 + 19.770(EQ) + Error Term

Table 3: Regression Coefficients for ROA

	Coefficients	Standard Error	t Stat	P-Value	Lower 95%	Upper 95%
Intercept	-5.081226681	2.22496566	-2.2837326	0.02298926	-9.45729854	-0.705154818
Component of Equity	19.76978466	2.65682339	7.44113617	0.00000000	14.54433319	24.99523613

Table 4: Analysis of Variance for ROA

	df	SS	MS	F	Significance F
Regression	1	5257.897648	5257.897648	55.3705075	7.88572E-13
Residual	348	33045.5411	94.95845144		
Total	349	38303.43875			

The panel regression analysis of ROA to Equity

Table 5: ROA to Equity

Correlated Random Effects - Hausman Test			
Test Cross-Section Random Effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	5.793114	1	0.0161

Table 6: Fixed Effects Panel Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Intercept	-14.7796	4.265587	-3.46484	0.0006
EQUITY	31.68158	5.203209	6.088853	0

The p-value of the Hausman test results (Table 5) is 0.0161, which is less than the significance level of 0.05; hence, the null hypothesis is rejected, and the fixed-effects panel model is applied. The equity component significantly impacts the return on assets, as the p-value is less than the significance level of 0.05 (Table 6).

Long-Term Debt Component: The regression results obtained above lead to the following regression equation:

ROA = 13.185 − 22.300(LTD) + Error Term

Table 7: Regression Coefficients for ROA

	Coefficients	Standard Error	t Stat	P-Value	Lower 95%	Upper 95%
Intercept	13.18493747	0.672418833	19.60822159	3.3866E-58	11.86242127	14.50745367
Component of Long-Term Debt	-22.30024726	4.135318923	-5.392630575	0.00000012	-30.43360998	-14.16688454

Conversely, the long-term debt component exhibited a significant negative coefficient of −22.300 ($p<0.000$) in relation to ROA. This indicates that for every 1% increase in the long-term debt component, ROA is expected to decrease by −22.300. The R-squared value of 0.026 suggests that approximately 2.6% of the variability in ROA can be explained by changes in the long-term debt component (Table 7).

The panel regression analysis ROA to LTD

Table 8: ROA to LTD

Correlated Random Effects - Hausman Test			
Test cross-section random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.01477	1	0.9033

Table 9: Random Effects Panel Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Intercept	13.17111	0.835104	15.77181	0
Long Term Debt	-22.1581	4.863813	-4.55571	0

The p-value of the Hausman-test results (Table 8) is 0.9033, which is greater than the significance level of 0.05; hence, the null hypothesis is not rejected, and the random effects panel model is applied. Long-term debt significantly impacts the return on assets, as the p-value is less than the significance level of 0.05 (Table 9).

Short-term Debt Component: The regression results obtained above lead to the following regression equation:

ROA = 13.881 − 32.380(STD) + Error Term

Table 10: Regression Coefficients for ROA

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	13.8810026	0.681576249	20.3660304	2.88325E-61	12.54047556	15.22152965
Component of Short-Term Debt	-32.38035378	4.866752885	-6.653379479	0.0000000001	-41.95230391	-22.80840365

Similar to long-term debt, the short-term debt component demonstrated a significant negative coefficient of −32.380 ($p<0.000$) in association with ROA (Table 10). This implies that for every 1% increase in the short-term debt component, ROA is expected to decrease by −32.380. The R-squared value of 0.095 suggests that approximately 9.5% of the variability in ROA can be explained by changes in the short-term debt component.

The panel regression analysis of ROA to STD

Table 11: ROA to STD

Correlated Random Effects - Hausman Test			
Test Cross-Section Random Effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	2.274136	1	0.1315

Table 12: Random Effects Panel Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Intercept	14.16539	0.882462	16.05212	0
SHORT TERM DEBT	-35.5933	5.57606	-6.38324	0

The p-value of the Hausman test results (Table 11) is 0.1315, which is greater than the significance level of 0.05; hence, the null hypothesis is not rejected, and the random-effects panel model is applied. Short-term debt significantly impacts the return on assets, as the p-value is lower than the level of significance of 0.05 (Table 12).

These results indicate that while the equity component positively influences ROA, both long-term and short-term debt components have adverse effects on ROA, highlighting the importance of maintaining a balanced capital structure to optimise asset utilisation and profitability (Table 13).

Return on Equity (ROE)

Equity Component: The regression analysis revealed a significant positive coefficient of 27.821 ($p<0.000$) for the equity component in predicting ROE. This suggests that for every percentage increase in the equity component of the firm’s capital structure, ROE is expected to increase by 27.821. The R-squared value of 0.078 implies that approximately 7.8% of the variability in ROE can be explained by changes in the equity component (Table 14).

The regression results obtained above lead to the following regression equation:

ROE = −6.845 + 27.821(EQ) + Error Term

Table 13: Analysis of Variance for ROE

	df	SS	MS	F	Significance F
Regression	1	10412.52471	10412.52471	29.2938122	1.16051E-07
Residual	348	123697.0649	355.4513361		
Total	349	134109.5897			

Table 14: Regression Coefficients for ROE

	Coefficients	Standard Error	t Stat	P-Value	Lower 95%	Upper 95%
Intercept	-6.844811364	4.304736541	-1.5900651	0.1127281	-15.3113853	1.6217626
Component of Equity	27.82107438	5.140270224	5.4123758	0.0000001	17.7111692	37.930979

The panel regression analysis of ROE to Equity

Table 15: ROE to Equity

Correlated Random Effects - Hausman Test			
Test Cross-Section Random Effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	14.55671	1	0.0001

Table 16: Fixed Effects Panel Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Intercept	-37.3376	7.854443	-4.75369	0
EQUITY	65.27315	9.580934	6.812818	0

The p-value of the Hausman-test results (Table 15) is 0.0001, which is less than the significance level of 0.05; hence, the null hypothesis is significantly rejected, and the fixed-effects panel model is applied. The equity component significantly impacts the return on equity, as the p-value is less than the level of significance of 0.05 (Table 16).

Long-term Debt Component: The regression results lead to the following regression equation:

ROE = 18.174 − 24.332(LTD) + Error Term

In contrast, the long-term debt component exhibited a significant negative coefficient of −24.332 (p=0.002) in relation to ROE. This indicates that for every percentage increase in the long-term debt component, ROE is expected to decrease by −24.332. The R-squared value of 0.026 suggests that approximately 2.6% of the variability in ROE can be explained by changes in the long-term debt component (Table 17).

Table 17: Regression Coefficients for ROE

	Coefficients	Standard Error	t Stat	P-Value	Lower 95%	Upper 95%
Intercept	18.1742576	1.29243325	14.06204733	7.05058E-36	15.63229442	20.7162207
Component of Long-Term Debt	-24.3318783	7.94835515	-3.0612470	0.002375585	-39.96473686	-8.69901989

The panel regression analysis ROE to LTD

Table 18: ROE to LTD

Correlated Random Effects - Hausman Test			
Test Cross-Section Random Effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.520164	1	0.4708

Table 19: Random Effects Panel Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Intercept	18.43886	1.783571	10.33817	0
Long Term Debt	-27.0511	9.970352	-2.71315	0.007

The p-value of the Hausman test results (Table 18) is 0.4708, which is greater than the significance level of 0.05; hence, the null hypothesis is not rejected, and the random-effects panel model is applied. Long-term debt significantly impacts return on equity, as the p-value is lower than the significance level of 0.05 (Table 19).

Short-term Debt Component: The regression results lead to the following regression equation:

ROE = 20.739 − 55.725(STD) + Error Term

Similarly, the short-term debt component demonstrated a significant negative coefficient of −55.725 (p<0.000) in relation to ROE. This implies that for every percentage increase in the short-term debt component, ROE is expected to decrease by −55.725 (Table 20). The R-squared value of 0.095 suggests that approximately 9.5% of the variability in ROE can be explained by changes in the short-term debt component.

Table 20: Regression Coefficients for ROE

	Coefficients	Standard Error	t Stat	P-Value	Lower 95%	Upper 95%
Intercept	20.73893155	1.287777431	16.10443781	5.37028E-44	18.20612546	23.27173764
Component of Short-Term Debt	-55.72536753	9.195294788	-6.060204573	0.000000003	-73.81071215	-37.64002291

The panel regression analysis ROE to STD

Table 21: ROE to STD

Correlated Random Effects - Hausman Test			
Test cross-section random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	8.916707	1	0.0028

Table 22: Fixed Effects Panel Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Intercept	24.2268	1.480144	16.36786	0
Short Term Debt	-95.1312	13.18189	-7.21681	0

The p-value of the Hausman test results (Table 21) is 0.0028, which is less than the significance level of 0.05; hence, the null hypothesis is significantly rejected, and the fixed-effects panel model is applied. The short-term debt significantly impacts the return on equity, as the p-value is less than the significance level of 0.05 (Table 22).

These results indicate that while the equity component positively influences ROE, both long-term and short-term debt components have adverse effects on ROE, emphasising the importance of maintaining a balanced capital structure to enhance shareholders' returns.

Return on Capital Employed (ROCE)

Equity Component: The regression analysis yielded a significant positive coefficient of 23.913 (p<0.000) for the equity component in predicting ROCE (Table 23). This suggests that for every percentage increase in the equity component of the firm's capital structure, ROCE is expected to increase by 23.913. The R-squared value of 0.107 implies that approximately 10.7% of the variability in ROCE can be explained by changes in the equity component (Table 24).

Table 23: Regression Coefficients for ROCE

	Coefficients	Standard Error	t Stat	P-Value	Lower 95%	Upper 95%
Intercept	-3.978356176	3.094681308	-1.285546323	0.199456253	-10.06498844	2.10827609
Component of Equity	23.91264801	3.695347679	6.471014391	0.000000000	16.64462259	31.18067343

The regression results obtained above lead to the following regression equation:

ROCE = −3.978 + 23.913(EQ) + Error Term

Table 24: Analysis of Variance for ROCE

	df	SS	MS	F	Significance F
Regression	1	7692.430698	7692.430698	41.87402725	3.30768E-10
Residual	348	63929.02853	183.704105		
Total	349	71621.45923			

The panel regression analysis ROCE to Equity

Table 25: ROCE to Equity

Correlated Random Effects - Hausman Test			
Test Cross-Section Random Effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	8.911293	1	0.0028

Table 26: Fixed Effects Panel Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Intercept	-21.7332	5.554774	-3.91253	0.0001
EQUITY	45.71963	6.775773	6.747516	0

The p-value of the Hausman test results (Table 25) is 0.0028, which is less than the significance level of 0.05; hence, the null hypothesis is significantly rejected, and the fixed effects panel model is applied. The equity component significantly impacts the return on capital employed, as the p-value is less than the level of significance of 0.05 (Table 26).

Long-term Debt Component: Conversely, the long-term debt component exhibited a significant negative coefficient of −28.594 ($p<0.000$) in relation to ROCE (Table 27). This indicates that for every percentage increase in the long-term debt component, ROCE is expected to decrease by −28.594. The R-squared value of 0.068 suggests that approximately 6.8% of the variability in ROCE can be explained by changes in the long-term debt component.

Table 27: Regression Coefficients for ROCE

	Coefficients	Standard Error	t Stat	P-Value	Lower 95%	Upper 95%
Intercept	18.2732964	0.924106467	19.77401646	7.2016E-59	16.45575998	20.09083299
Component of Long-Term Equity	-28.594202	5.683176574	-5.031376725	0.00000078	-39.77189802	-17.41650665

The regression results obtained lead to the following regression equation:

ROCE = 18.273 − 28.594(LTD) + Error Term

The panel regression analysis ROCE to LTD

Table 28: ROCE to LTD

Correlated Random Effects - Hausman Test			
Test Cross-Section Random Effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section Random	1.639115	1	0.2004

The p-value of the Hausman test results (Table 28) is 0.2004, which is greater than the significance level of 0.05; hence, the null hypothesis is not rejected, and the random-effects panel model is applied. Long-term debt significantly impacts the return on capital employed, as the p-value is less than the significance level of 0.05 (Table 29).

Table 29: Random Effects Panel Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Intercept	18.73248	1.379856	13.57568	0
LONG TERM DEBT	-33.3132	7.404264	-4.49919	0

Short-term Debt Component: The regression results obtained above lead to the following regression equation:

ROCE = 18.751 − 36.831(STD) + Error Term

Table 30: Regression Coefficients for ROCE

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	18.75080779	0.950090277	19.73581695	1.02874E-58	16.88216622	20.61944936
Component of Short-Term Debt	-36.83052406	6.784060629	-5.428979203	0.00000011	-50.17344316	-23.48760497

Similarly, the short-term debt component demonstrated a significant negative coefficient of −54.865 ($p<0.000$) in association with ROCE (Table 30). This implies that for every 1% increase in the short-term debt component, ROCE is expected to decrease by −54.865. The R-squared value of 0.095 suggests that approximately 9.5% of the variability in ROCE can be explained by changes in the short-term debt component.

The panel regression analysis ROCE to STD

Table 31: ROCE to STD

Correlated Random Effects - Hausman Test			
Test Cross-Section Random Effects			
Test Summary	**Chi-Sq. Statistic**	**Chi-Sq. d.f.**	**Prob.**
Cross-section Random	1.887065	1	0.1695

Random Effects Panel Model

Table 32: Random Effects Panel Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Intercept	19.35247	1.398269	13.84031	0
SHort Term Debt	-43.6281	8.00694	-5.44879	0

The p-value of the Hausman test results (Table 31) is 0.1695, which is greater than the significance level of 0.05; hence, the null hypothesis is not rejected, and the random-effects panel model is applied. Short-term debt significantly impacts the return on capital employed, as the p-value is less than the significance level of 0.05 (Table 32).

These results indicate that while the equity component positively influences ROCE, both long-term and short-term debt components have adverse effects on ROCE, underscoring the importance of maintaining a balanced capital structure to optimise capital utilisation and overall profitability.

CONCLUSION AND SUGGESTIONS

Each pharmaceutical company operates within its unique micro-environment, encompassing investors, decision-makers, regulators, and management policies. Hence, devising a universal strategy to suit the diverse needs and environments of numerous pharmaceutical firms is immensely challenging.

Analysing the impact of equity and debt on firms' financial performance in terms of ROE, ROA, and ROCE has revealed a positive effect of equity and a negative effect of debt. While debt alleviate tax burdens, they raise shareholder concerns about financial risk, affecting share prices and performance. Thus, firms should prioritise equity financing, mindful of diluting ownership excessively, which could cede control to third parties.

Short-term debt exerted a more severe adverse impact on financial indicators, likely due to heightened repayment pressure, which undermines profitability. Leveraged firms should lean toward long-term debt for well-planned projects, minimising short-term debt usage to avoid negative financial implications.

Consequently, firms are advised to prioritise equity, followed by long-term debt, and cautiously consider short-term debt in their capital structure planning.

The research concludes that equity financing is optimal for firms' financial performance. While debt aid tax reduction, their significant amounts may not be the most effective financing option, leading to financial deterioration alongside increased interest payments on debt.

Overall, capital structure decisions are critical, with equity emerging as the preferred option for financing capital-intensive pharmaceutical projects, according to the research findings.

REFERENCES

Abor, J. (2005). The effect of capital structure on profitability: An empirical analysis of listed firms in Ghana. *Journal of Risk Finance, 6*(5), 438–445. doi:https://doi.org/10.1108/15265940510633505

Baker, S. H. (1973). Risk, leverage and profitability: An industry analysis. *The Review of Economics and Statistics, 55*(4), 503–507. doi:https://doi.org/10.2307/1925675

Berger, A. N., & Di Patti, E. B. (2006). Capital structure and firm performance: A new approach to testing agency theory and an application to the banking industry. *Journal of Banking & Finance, 30*(4), 1065–1102. doi:https://doi.org/10.1016/j.jbankfin.2005.05.015

Boateng, A. (2004). Determinants of capital structure: Evidence from international joint ventures in Ghana. *International Journal of Social Economics, 31*(1/2), 56–66. doi:https://doi.org/10.1108/03068290410515411

Booth, L., Aivazian, V., Demirguc-Kunt, A., & Maksimovic, V. (2001). Capital structure in developing countries. *The Journal of Finance, 56*(1), 87–130. doi:https://doi.org/10.1111/0022-1082.00320

Brigham, E. F., & Gapenski, L. C. (1996). *Intermediate financial management* (5th ed.). The Dryden Press.

Chakraborty, A., & Soni, P. (2017). Determinants of capital structure in Indian banks: A panel data analysis. *Journal of Commerce and Accounting Research, 6*(4), 73-88.

Charreaux, G. (1997). Is the public enterprise necessarily less efficient? *French Management Review, 115*(1), 38–56.

Chaudhuri, P. (2021). Why capital structure matters: Evidence from the banking sector in Luxembourg. *International Journal of Banking, Risk and Insurance, 9*(2), 102–115.

de Mesquita, J. M. C., & Lara, J. E. (2003, July). *Capital structure and profitability: The Brazilian case.* In Academy of Business and Administrative Science Conference, Vancouver, Canada (vol. 1, p. 14).

Deesomsak, R., Paudyal, K., & Pescetto, G. (2004). The determinants of capital structure: Evidence from the Asia Pacific region. *Journal of Multinational Financial Management, 14*(4–5), 387–405. doi:https://doi.org/10.1016/j.mulfin.2004.03.001

Ebaid, I. E. (2009). The impact of capital-structure choice on firm performance: Empirical evidence from Egypt. *The Journal of Risk Finance, 10*(5), 477–487. doi:https://doi.org/10.1108/15265940911001385

Erasmus, P. D. (2008). *Evaluating value based financial performance measures* (Doctoral dissertation, Stellenbosch: University of Stellenbosch).

Fama, E. F., & French, K. R. (1998). *The corporate cost of capital and the return on corporate investment.* Center for Research in Security Prices, University of Chicago, Working Paper.

Ghosh, S., & Chakrabarty, A. (2020). Capital structure and bank performance: Evidence from emerging markets. *International Journal of Banking, Risk and Insurance, 9*(1), 80–95.

Gleason, K. C., Mathur, L. K., & Mathur, I. (2000). The interrelationship between culture, capital structure, and performance: Evidence from European retailers. *Journal of Business Research, 50*(2), 185–191. doi:https://doi.org/10.1016/S0148-2963(99)00031-4

Gupta, A., & Arya, P. K. (2020). Impact of splits on stock splits ratios around announcement day: Empirical evidence from India. *Investment Management and Financial Innovations, 17*(3), 345–359. doi:https://doi.org/10.21511/imfi.17(3).2020.26

Hadlock, C., & James, C. (2002). Do banks provide financial slack*? The Journal of Finance, 57*(3), 1383–1420. doi:https://doi.org/10.1111/1540-6261.00463

Hammes, K. (1998, April). *Various aspects of capital structure in Poland.* In 4th Conference on Financial Sector Reform in Central and Eastern Europe (vol. 1998, pp. 24–26).

Harris, M., & Raviv, A. (1991). The theory of capital structure. *The Journal of Finance, 46*(1), 297–355. doi:https://doi.org/10.1111/j.1540-6261.1991.tb03753.x

Hutchinson, P. (1999). Small enterprise: Finance, ownership and control. *International Journal of Management Reviews, 1*(3), 343–365. doi:https://doi.org/10.1111/1468-2370.00018

Hutchinson, R. W. (1995). The capital structure and investment decisions of the small owner-managed firm: Some exploratory issues. *Small Business Economics, 7*(3), 231–239. doi:https://doi.org/10.1007/BF01108686

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics, 3*(4), 305–360. doi:https://doi.org/10.1016/0304-405X(76)90026-X

Joshua, A. (2007). Debt policy and performance of SMEs: Evidence from Ghanaian and South African firms. *Journal of Risk Finance, 8*(4), 37–51. doi:https://doi.org/10.1108/15265940710783797

Khan, A., & Ali, S. (2021). Impact of capital structure on the financial performance of banks: A comparative study of Islamic and conventional banks. *International Journal of Banking, Risk and Insurance, 9*(2), 145–160.

Kisgen, D. J. (2006). Credit ratings and capital structure. *The Journal of Finance, 61*(3), 1035-1072. doi:https://doi.org/10.1111/j.1540-6261.2006.00866.x

Krishnan, V. S., & Moyer, R. C. (1997). Performance, capital structure and home country: An analysis of Asian corporations. *Global Finance Journal, 8*(1), 129–143. doi:https://doi.org/10.1016/S1044-0283(97)90010-5

Kumar, S., & Soni, R. (2020). Capital structure, firm size, and performance in Indian manufacturing sector: Evidence from panel data. *Journal of Commerce and Accounting Research, 8*(1), 60–76.

Majumdar, S. K., & Chhibber, P. (1999). Capital structure and performance: Evidence from a transition economy on an aspect of corporate governance. *Public Choice, 98*(3–4), 287–305. doi:https://doi.org/10.1023/A:1018345123031

Miller, M. H., & Rock, K. (1985). Dividend policy under asymmetric information. *The Journal of Finance, 40*(4), 1031–1051. doi:https://doi.org/10.1111/j.1540-6261.1985.tb02362.x

Modigliani, F., & Miller, M. H. (1958). The cost of capital, corporation finance and the theory of investment. *American Economic Review, 48*(3), 261–297.

Modigliani, F., & Miller, M. H. (1963). Corporate income taxes and the cost of capital: A correction. *American Economic Review, 53*(3), 433–443.

Nimalathasan, B., & Brabete, V. (2010). Capital structure and its impact on profitability: A study of listed manufacturing companies in Sri Lanka. *Revista Tinerilor Economisti (The Young Economists Journal), 1*(15), 7–16.

Pelham, A. M. (2000). Market orientation and other potential influences on performance in small and medium-sized manufacturing firms. *Journal of Small Business Management, 38*(1), 48–67.

Petersen, M. A., & Rajan, R. G. (1994). The benefits of lending relationships: Evidence from small business data. *The Journal of Finance, 49*(1), 3–37. doi:https://doi.org/10.1111/j.1540-6261.1994.tb04418.x

Robert, W., & Nick, W. (2002). Small and medium size enterprise financing: A note on some of the empirical implications of a pecking order. *Journal of Business and Accounting, 29*(3-4), 439–455. doi:https://doi.org/10.1111/1468-5957.00438

Roden, D. M., & Lewellen, W. G. (1995). Corporate capital structure decisions: Evidence from leveraged buyouts. *Financial Management, 24*(2), 76–87. doi:https://doi.org/10.2307/3665536

Singh, R., & Mishra, P. (2018). Capital structure decisions and their impact on corporate performance: Evidence from the Indian retail sector. *Journal of Commerce and Accounting Research, 7*(2), 32–48.

Taub, A. J. (1975). Determinants of the firm's capital structure. *The Review of Economics and Statistics, 57*(4), 410–416. doi:https://doi.org/10.2307/1923924

Titman, S., & Wessels, R. (1988). The determinants of capital structure choice. *The Journal of Finance, 43*(1), 1–19. doi:https://doi.org/10.1111/j.1540-6261.1988.tb02585.x

Weinraub, H. J., & Visscher, S. (1998). Industry practice relating to aggressive conservative working capital policies. *Journal of Financial and Strategic Decisions, 11*(2), 11–18.

Yat Hung, C., Ping Chuen Albert, C., & Chi Man Eddie, H. (2002). Capital structure and profitability of the property and construction sectors in Hong Kong. *Journal of Property Investment & Finance, 20*(6), 434–453. doi:https://doi.org/10.1108/14635780210446469