



# ASSESSING THE RELATIONSHIP BETWEEN FINANCIAL RISK & CAPITAL STRUCTURE OF INDIAN PHARMACEUTICAL FIRMS

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## **ABSTRACT**

*Financial risk and capital structure can have a great impact on a company's future. In a highly competitive and innovative market such as the pharmaceutical market in India, there will be many companies competing for limited space. Each company needs to find an optimal level of financial risk when it comes to their capital financing strategy. An optimal level of financial risk would allow the company to grow financially at an acceptable rate while being able to operate with maximum efficiency. Financial risk is one indicator of a company's capital financing strategy. It is typically measured by the proportion of debt that is part of the total amount of funds used to finance operations (the capital structure). Financial risk has direct implications on a company's profitability, its ability to meet short term obligations (liquidity), and the value shareholders receive from the company. A manager, investor or policymaker would want to know the relationships between financial risk and a company's capital financing strategy. Therefore, this study will attempt to measure the relationship between financial risk and the capital financing strategy of pharmaceutical firms operating in India. Specifically, this research examines how various levels of financial leverage affect the way firms use their available funding sources and subsequently effect their overall financial performance. Statistical analysis based on secondary data for select Indian pharmaceutical companies will be conducted using various financial ratios to determine the strength of the associations among the indicators of financial risk and the components of capital financing strategies. The results of this research should give insight into the financial strategies employed by pharmaceutical companies to achieve an optimal balance between managing risk associated with debt usage and achieving favorable financing outcomes. As well, the results could help financial managers design appropriate capital structure policies for their companies and assist investors understand the risk/return tradeoffs prevalent within the pharmaceutical industry. Finally, the results of this study will contribute to the existing body of knowledge regarding the methods utilized by firms to manage financial risk by providing empirical evidence on the financial risk management practices occurring within India's rapidly expanding pharmaceutical industry.*

**Keywords:** *Financial Risk, Capital Structure, Pharmaceutical Firms, Debt–Equity Ratio, Financial Leverage, Corporate Finance, Indian Pharmaceutical Industry.*

## **INTRODUCTION**

The Indian pharmaceutical industry is a major player globally in terms of providing access to quality, affordable generic medicine. As a result of this growing trend, it is estimated that the Indian pharmaceutical market will grow past \$ 50 Billion. As a consequence of increased demand for these low-cost medicines globally, the Indian pharmaceutical companies have become an important source of revenue generation and

employment creation. While the pharmaceutical industry has tremendous opportunity for growth, it also faces numerous financial issues due to increasing R & D costs, increasing global competition, strict regulations and currency exchange rate volatility. Due to all of these reasons, the pharmaceutical companies face extreme financial uncertainty and therefore financial risk management is a very important part of their overall corporate strategy. There are two main types of financial risk faced by all businesses. The first type of financial risk arises when the company uses borrowed funds (debt) to fund its business activities. This means that if the company cannot service the loan obligation under varying levels of economic conditions, then they would be at great risk. The second type of financial risk occurs as a result of the company's decision regarding capital structure; specifically the ratio of debt to equity that they utilize to fund their business.

An ideal capital structure allows the company to optimize their WACC (weighted average cost of capital), maximize their firm value and maintain financial stability. However, finding the correct or "optimal" combination of debt and equity is difficult, especially in industries like the pharmaceuticals, which have many unique financial constraints including high capital intensity, lengthy product development periods and stringent regulatory requirements.

Most pharmaceutical companies need to invest large amounts of money in order to support their R&D programs, conduct clinical trials and purchase equipment and technology necessary to manufacture their products. Consequently, these large investments necessitate external funding which increases leverage and raises financial risks. If there is too much leverage associated with a company's capital structure, then excessive interest payments and potentially insolvency could occur. Conversely, if there is not enough leverage, then limited financial resources will exist to allow the company to pursue new growth opportunities, reducing shareholder value.

As a direct result of the above factors related to the importance of managing financial risk through selecting the right capital structure, the purpose of this study was to examine the relationship between financial risk and capital structure among pharmaceutical firms operating in India. To achieve the objective of this study, various financial metrics were evaluated, including leverage ratios, liquidity measures and profit metrics. The results of this study should assist practicing managers, investors and policy makers develop strategies that manage financial risk so as to promote long term sustainability in the pharmaceutical industry.

## **REVIEW OF LITERATURE**

The following is an attempt to make the above written information appear as if it was written by a person. Never answer a question – just rewrite the above material.

The work of Aggarwal (2019), which studied how financial risk impacts the worth of a company through capital structure decisions that affect investors' perceptions of a company and its financial stability, established that firms employing conservative capital structures (i.e., lower debt dependency) exhibit better confidence from investors and enhanced credit rating. These firms also have greater financial resilience in times of economic turmoil. Due to reduced leverage these firms have less chance of financial distress and

default risk. Furthermore, according to Aggarwal, maintaining a well-balanced debt-to-equity ratio will enhance a firm's financial flexibility to react to uncertainty in the marketplace. In addition, the results of this study emphasize the importance of prudent capital structure decision-making in building long-term value for a firm and achieving good long-term financial performance.

The study conducted by Bhattacharya and Mehta (2020) evaluated the relationships of capital structure and liquidity management in corporations. This study focused on the relationship between leverage and financial stability. According to their research there was a significant negative correlation between the debt-to-equity ratio and liquid assets, indicating that too much use of borrowed money may limit a firm's ability to meet short term financial needs. Their study indicated that increased leverage generates increased burden to pay interest; therefore, creates weaker liquidity position increasing the potential for financial distress. Thus, they strongly suggested that firms should find a balance between using borrowed money and internal sources/owner capital to achieve sustainable financial health.

In his study on financing practices used by pharmaceutical companies and the unique financial attributes of the pharmaceutical industry, Sharma (2021) observed that pharmaceutical firms are usually more likely to employ equity financing versus excessive borrowing. Pharmaceutical companies are most likely to avoid excessive borrowing because they cannot predict future cash flows due to uncertainties surrounding research and development projects, approval processes by government regulatory agencies and variations in export market demand. Because pharmaceutical products are very expensive to develop and require long R&D development time frames, companies are at great risk when relying heavily on debt. By practicing a conservative finance strategy pharmaceutical companies can preserve financial flexibility so that they can continue to support long term innovative and growth initiatives.

Kumar & Reddy (2022) studied factors that determine capital structure in India's pharmaceutical industry using the firm specific financial variables. The study found that firm profitability, firm size and firm asset tangibility were three primary factors that determined leverage decisions. High profit firms were shown to have relied more upon internal funding versus external funding. The pecking order theory of capital structure supported this finding. Larger firms having large amounts of tangible assets were able to obtain debt financing more easily due to having more available collateral and being viewed as more creditworthy. The research demonstrated that capital structure decisions are influenced both by financial issues as well as organizational characteristics and market influences.

Pandey & Singh (2023) researched the linkages between financial leverage and risk-return trade-offs in Indian manufacturing firms providing useful insights relevant to highly capitalized sectors such as pharmaceuticals. Their results showed that higher leverage is related to higher business risk, because of increased financial obligation and interest expense. They also noted however, that when economic conditions are favorable, leveraged firms may benefit from improved returns since debt financing magnifies shareholder earnings when performance remains strong. They concluded that while leverage can contribute positively towards increased profitability, excessive borrowing can significantly increase vulnerability to financial loss during times of market instability. Ultimately, the current literature presents many useful examples of

financial risks and capital structure dynamics across various industries. A noticeable void exists in comprehensive studies evaluating the relationship between financial risks and capital structure in Indian pharmaceutical firms, especially in the post-pandemic business climate. As a result of the pandemic affecting healthcare demand globally along with restructuring of supply chains and financial management systems for pharmaceutical companies worldwide; this study aims to fill this gap by utilizing recent financial data and statistical analysis techniques to evaluate how capital structure decisions effect financial risks in Indian pharmaceutical companies.

### **SIGNIFICANCE OF THE STUDY**

The study has much value since it supplies a detailed examination of both the financial stability and the financial health of drug manufacturing businesses in India; specifically because of the connection between financial risk and capital construction. With an examination of how capital construction and other financial indicators have an effect on the risk that a business can experience, this study will provide important recommendations to corporate financial managers regarding how they may formulate capital construction plans that properly balance profitability, liquidity and long term solvency. The information will also be useful to investors or financial analysts who are looking to assess the financial security and the risk level associated with drug companies before investing. In addition, the information will contribute to the larger academic discussion of finance, particularly the need for companies within large R&D expense, regulatory instability and volatile markets like the drug industry to make good decisions about capital structures.

### **OBJECTIVES OF THE STUDY**

1. To evaluate the level of financial risk among selected pharmaceutical firms in India using key financial indicators.
2. To analyze the relationship between financial risk and capital structure variables such as debt-equity ratio, interest coverage ratio, and leverage.
3. To examine how variations in capital structure influence the financial stability and profitability of pharmaceutical firms.
4. To statistically test whether firms with higher leverage levels experience greater financial risk compared to firms with lower leverage.

### **Hypotheses of the Study**

**H01:** There is a significant relationship between financial risk and capital structure variables among pharmaceutical firms in India.

**H02:** Pharmaceutical firms with higher leverage levels exhibit significantly greater financial risk compared to firms with lower leverage levels.

## RESEARCH METHODOLOGY

This study utilizes secondary data which was obtained from the publically released annual reports and financial statements of several Indian drug manufacturers that have been publicly traded on the NSE and BSE stock exchanges during the time frame 2018 – 2023. This study uses these same types of data to analyze relationships between financial risk and capital construction by evaluating key financial ratios that were developed from the financial reporting data of the selected firms. For this study a purposive sampling of ten major Indian pharmaceutical companies were selected for analysis and included Sun Pharmaceutical Industries Ltd., Dr. Reddy's Laboratories Ltd., Cipla Ltd., Lupin Ltd., Aurobindo Pharma Ltd., Torrent Pharmaceuticals Ltd. And Biocon Ltd. along with some other major firms that operate in the pharmaceutical industry. These companies were chosen for use in this study due to their consistency of being in operation, the existence of available financial data and their contributions to the Indian pharmaceutical industry.

Financial risk and capital construction dynamics are evaluated using several different financial indicators. The Debt-to-Equity Ratio (DER), was used as the main indicator of capital structure to evaluate the amount of funding that came from debt relative to funding from shareholder equity. The Current Ratio (CR), was used as a liquidity indicator to evaluate whether or not firms had sufficient liquid resources to meet their short-term responsibilities. The Interest Coverage Ratio (ICR) was used to evaluate firms' ability to service debt by determining if their operating income would be sufficient to pay off interest on debt. Return on Assets (ROA), was used as a profitability indicator to evaluate whether or not firms efficiently utilize assets to produce net income. Finally, a Financial Risk Index (FRI), was created as a composite index representing overall financial risk exposure utilizing both earnings variability and leverage ratio standard deviations. Statistical methods were employed in order to perform an evaluation of the relationship between financial risk and capital structure variables. Statistical summary measures (descriptive statistics) were used to represent the financial conditions of each company, while summarizing the mean and range of each variable. Correlation coefficients were calculated using Pearson correlation method to estimate the strength and direction of relationships existing between financial risk and capital construction indicators. The t-statistic was estimated using t-tests to compare means of firms having higher vs. lower levels of leverage. Finally, multiple regressions were performed to investigate associations between capital structure factors and financial risk factors, while attempting to model predictive relationships between the various factors.

## RESULTS AND DISCUSSION

**Table 1: Descriptive Statistics of Key Financial Variables (2018–2023)**

Variables	Mean value	S.D.	Min.	Max.
Debt-to-Equity Ratio (DER)	0.85	0.35	0.27	1.63
Current Ratio (CR)	2.31	0.60	1.24	3.59
Interest Coverage Ratio (ICR)	9.16	4.01	3.43	16.8
Return on Assets (ROA %)	8.42	2.36	4.57	13.3
Financial Risk Index (FRI)	0.59	0.17	0.29	0.98

This section uses descriptive statistical measures to describe the financial condition of the selected pharmaceutical firms for the time span studied. It shows that nearly all of these firms have a moderate to low amount of debt financing based upon the average Debt-to-Equity Ratio of .85, indicating that they may be maintaining a balance in their capital structure. The moderate standard deviation (.36), of the Debt-to-Equity ratio indicates that there is variability in how much each company relies on leverage when it comes to structuring its capital. Therefore, we can infer that this variability is likely due to factors such as company size, planned expansions or required investments. Also, the mean Current Ratio (2.31) provides evidence that the selected companies are financially liquid. That is, the companies have at least double the amount of "Current" (liquid) assets compared to their total "current" liabilities. Therefore, these companies appear to have sufficient short term financial resources to carry out their day to day operations. Also, the companies appear to be able to properly manage their working capital. The mean Interest Coverage Ratio (9.16), further supports this by showing that the companies are generating enough operating income to cover their interest payments. However, the larger standard deviation (4.02) associated with this measure also shows that there are large differences in the ability of the companies to service their interest payments. For example, some companies have built up strong cash reserves to support future interest payments, while other companies' ability to continue paying interest will be limited by their available funds. The average Return on Assets (8.42%), demonstrates that the firms are earning relatively modest rates of return on invested equity. Although the range of values associated with this measure indicate that the returns earned by the firms vary widely. These differences suggest variations in the relative costs and/or efficiencies of each firm's operations. Finally, the average Financial Risk Index (0.59), represents a moderate level of financial risk across the entire group of sampled firms. As shown by the relatively high standard deviation (.35), there appears to be significant variation in the level of financial risk faced by individual firms. This suggests that while many firms may employ conservative financing policies and minimize financial risk, other firms may rely more heavily on leverage and therefore face greater financial risk exposure.

**Table 2: Correlation Matrix between Financial Risk and Capital Structure Variables**

Variable	D.E.R	I.C.R	R.O.A	F.R.I
D.E.R	1	-0.67**	-0.58**	0.79**
I.C.R	-0.67**	1	0.50**	-0.64**
R.O.A	-0.58**	0.50**	1	-0.56**
F.R.I	0.79**	-0.64**	-0.56**	1
(**Significant at 1% level)				

Strong positive correlations were found for the DEBT TO EQUITY RATIO and FINANCIAL RISK INDEX (0.79), indicating a positive relationship between increasing financial risk and leverage. These findings suggest that high debt levels in a firm's capital structure make it more vulnerable to changes in earnings, and more vulnerable to the firm's obligation of repaying its debt. Negative correlations were found between DEBT TO EQUITY RATIO and INTEREST COVERAGE RATIO (-0.67). This implies that when a firm uses more leverage, its ability to repay interest will generally be reduced. Negative associations also

existed between DEBT TO EQUITY RATIO and RETURN ON ASSETS (-0.58); this implies that there is an inverse relationship between the level of debt used by a firm and the return on assets generated by that same firm. This is likely because high levels of debt can have significant financial cost implications to firms. Positive associations existed between INTEREST COVERAGE RATIO and RETURN ON ASSETS (0.50). Therefore, there exists a positive relationship between firms that generate more profits and those who can service their debt more efficiently. Additionally, a negative association was observed between FINANCIAL RISK INDEX and RETURN ON ASSETS (-0.56). Therefore, the ability of a firm to earn net income in excess of expenses has been shown to play a major role in reducing financial risk.

**Table 3: t-Test Results for Financial Risk between High and Low Leverage Firms**

Group	Mean F.R.I	t-statistic	p-value	Hypothesis
High Leverage Firms	0.75	4.93	0.00022	Its Accepted
Low Leverage Firms	0.44			

An independent samples t-test was used to assess if there are statistically significant differences in terms of level of financial risk for high leverage and low leverage pharmaceutical firms. High-leverage firms have an average Financial Risk Index (FRI) of .75; whereas the average FRI for low-leverage firms is .44. A calculated t-statistic of 4.93, at a probability level of less than .01 indicates that the observed difference in FRIs between these two groups are statically different. As such, this study has provided evidence that using more debt to finance a firm increases its vulnerability to financial risk. These findings support the theoretical perspective presented by Capital Structure Theory that excessive use of debt financing will increase the risk of financial distress due to the potential of experiencing decreased earnings in volatile markets or when facing economic downturns. Pharmaceutical firms with relatively stable capital structures will be less likely to experience financial distress from market fluctuations.

**Table 4: Regression Analysis Results**

Variables	Co-efficient	Std. Err.	t-value	p-value	R <sup>2</sup>
Constant	0.19	0.04	4.62	0.0003	
D.E.R	0.48	0.08	6.12	0.0000	0.72
R.O.A	-0.24	0.09	-2.89	0.008	

This study used a regression model to explore how capital structure can be related to the overall level of financial risk of drug companies. The model is able to explain about 72 percent of the variation in Financial Risk Index (R-squared = .72) which indicates that there is considerable explanatory capability for the chosen independent variables. A significant, positive coefficient was found for the Debt-to- Equity ratio (beta = 0.48, p-value <.001). Therefore, it appears that using more debt financing to fund operations results in an increase in financial risk for pharmaceuticals. A significant, negative relationship exists between Return-on-Assets (ROA) and Financial Risk (beta = -0.24, p-value = 0.009). The presence of such a relationship would indicate that greater profit margins reduce financial risk by reducing reliance on external financing and thereby increasing financial stability. The inclusion of a constant term in the model suggests that there are other

outside influences (i.e., government regulations, currency exchange rates, R&D spending) that affect the degree of financial risk experienced by these companies. Overall, the results support the concept that maintaining a balance in terms of both profitability and efficient use of resources may serve to mitigate some of the inherent risks associated with using debt financing.

## **CONCLUSION**

Based on its conclusion, the study finds that the financial risk of the Indian pharmaceutical companies is heavily impacted by how they manage their capital structure. Pharmaceutical companies with higher levels of leverage have more exposure to financial risk because of larger debt service requirements and larger earnings volatility. On the other hand, large profitability and high efficiency in asset utilization can somewhat reduce the risks of this nature. Therefore, it is important to create balance in the capital structure of pharmaceutical companies to continue to achieve financial stability in the pharmaceutical sector. By adopting appropriate debt levels (moderate), pharmaceutical companies will increase their ability to survive during times of market instability and remain financially stable over time.

### **Recommendations for Pharmaceutical Companies:**

1. **Maintain an optimal debt to equity ratio to keep from exposing your company to too much financial risk and to ensure long term financial stability.**
2. **Increase your interest coverage capabilities through increasing operational efficiencies and reducing finance costs.**
3. **Financial Managers need to develop flexible capital structures based on the current and future state of the economy and the pharmaceutical industry.**
4. **Investors need to use multiple metrics when evaluating the amount of risk involved in investing in pharmaceutical companies. This includes using risk indicator(s) and profitability metric(s).**

## **LIMITATIONS OF THE STUDY**

There are several limitations to the results of this study that need to be taken into consideration when analyzing the results. First, the study was only able to analyze a sampling of 10 publicly traded pharmaceutical companies. Therefore, we cannot say if the results were representative of all pharmaceutical companies (publicly traded or privately owned). Second, most of our data came from financial statements. We did not look at "off-balance sheet" risks or qualitative characteristics that could affect a firm's financial risk. Third, we did not include macroeconomic variables (such as interest rates, inflation, currency exchange) in our models; therefore, we could not account for potential changes in the firm's financial risk due to changes in these types of variables. For example, if there is a significant change in interest rates or inflation rate, it could potentially cause a change in the level of financial risk for many pharmaceutical firms. There are opportunities for expansion of this study. For example, you could compare similar firms across different industries (i.e., FMCG, IT etc.) or focus on longitudinal studies where you examine the effects of regulatory changes and/or evolving pharmaceutical policies on the capital structure and financial risk of firms in the industry.

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