Financial Health and Capital Structure Dynamics: An Empirical Study of Selected Pharmaceutical Firms

Discipline: Commerce

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Abstract

This study investigates the effects of financial health on pharmaceutical firms' capital structure, with financial stability as the primary variable. This research uses panel data from 50 pharmaceutical firms for ten years to analyze the influence of a firm's financial health on its leverage as measured by the Debt-Equity Ratio, employing several econometric models: Random Effects and Fixed Effects. Pooled Ordinary Least Squares. The fixed-effects model emerged as the model appropriate to explain the nexus. The results showed that financial health had a highly unfavorable relationship with capital structure, such that companies with better financial well-being tend to avoid utilizing higher debt levels. Firm size, profitability, liquidity, return on assets, and interest coverage ratios have also been examined to explain the nexus comprehensively. The study's findings underscore the importance of maintaining strong financial health in determining capital structure decisions, which is significant for both corporate management and investors. By maintaining financial stability, pharmaceutical companies can reduce their dependence on debt, thereby reducing financial risk and enhancing long-term sustainability.

Key words: ICR-Interest coverage ratio, ROA -Return on Assets.

Introduction

A company's financial decisions are critical to its management. These judgments include determining an ideal capital structure for a firm. Different ideas of capital structure can be seen in this context. Even after Modigliani and Miller (1958) introduced the irrelevance hypothesis, very robust debates regarding the importance of capital structure continue; however, theoretical evidence supporting this phenomenon needs to be more consistent. Lenders and investors are also particularly interested in the D/E ratio to estimate the company's dependency on debt and the danger of potential bankruptcy. The interplay between financial health and capital structure is complex, diverse, and influenced by internal and external factors. Capital structure refers to the proportion of debt and equity funding used by a firm. This will be crucial in evaluating a firm's financial stability and performance. Several studies have shown that the relationship between capital structure and financial health is industry—and time-specific. The following are some important findings from the research papers provided.

The capital structure profoundly affects the corporation's value, especially in the health sub-sector of the Indonesia Stock Exchange. An increased Debt to Asset Ratio negatively impacts business value, whereas an increased Debt to Equity Ratio and Return on Assets positively impact it, showing investors' confidence (Arief et al., 2022). High leverage may hinder performance in the real estate sector, but moderate debt levels can spur innovation in the technology and healthcare sectors (Tao, 2024). The COVID-19 pandemic has altered capital structure dynamics as companies in the GCC increase long-term debt financing to spur economic recovery. The shift highlights the role of macroeconomic factors in capital structure decisions during crises (Ahmed et al., 2024).

In Korean companies, internal factors like profitability influence capital structure during times of stability, but macroeconomic conditions exert more pressure during times of decline. This calls for flexible financial solutions (Choi et al., 2024). Theoretical models Modigliani-Miller theorem, for instance, the case for capital structure irrelevance in certain circumstances. However, practical studies underscore the debt tax shield's importance and bankruptcy's financial implications (Makrevska, 2023).

The dynamic trade-off theory and capital structure changes have been crucial to understanding how enterprises may optimize their capital structure to enhance financial health (Makrevska, 2023). While capital structure is a prominent factor in financial health, it is essential to account for industry-specific characteristics and economic conditions. Companies must balance internal dynamics with outward forces to design suitable capital structure plans that promote long-term financial stability and growth.

Organizations utilize internal and external sources of finance to enhance financial performance, which later affects the firm's capital structure. Decisions regarding capital structure are crucial for organizations because they can help improve the firm's returns and allow it to operate smoothly in an ever-changing competitive climate. Traditionally, financial management was underestimated and solely emphasized in acquiring money; however, it has become the heart of every business activity today. It encompasses the acquisition, usage, and control of funds. It is a direct contributor to the performance of an organization. This is why finance managers must find the most appropriate capital mix to increase financial performance. There is a need to establish a relationship between financial condition and capital structure.

Objectives

1. To inquire the relationship between financial health and the capital structure
2. To investigate how financial indicators such as Profitability, ICR, ROA, leverage affects capital structure

Literature Review

The theoretical underpinnings of capital structure decisions are mainly based on the Modigliani-Miller theorem, the Pecking Order theory, and the Trade-off theory. Each of these ideas presents a different perspective on how companies should structure their blend of debt and equity to finance operations. The Modigliani-Miller theorem holds that, for certain conditions, the value of a firm is not influenced by its capital structure even though real-world imperfections exist in The Pecking Order and Trade-off theories. The Modigliani-Miller theorem, first published in 1958, suggests that in an ideal market, a firm's capital structure does not impact its value. That means the choice between debt and equity does not matter to the company's market value (Giglio, 2022) (Brusov & Filatova, 2023). The theory is based on the assumption that there are no taxes, bankruptcy costs, or asymmetric information, which are rarely seen in real-life scenarios. "The Evolution of Contemporary Capital Structure Theory: A Review," 2023

The Pecking Order theory is said to have been devised in reaction to the constraints imposed by the Modigliani-Miller theorem; according to this, firms prefer internal finance and issue debt or stock only as a last resort. This is attributed to informational asymmetry between managers and investors (Yakubu et al., 2021). Empirical evidence, including that of Ghanaian firms, shows that corporations generally follow this structure, preferring retained earnings to debt and then debt over equity, incredibly when profitable (Yakubu et al., 2021).

The Trade-off argument states that firms balance the tax benefits of debt against the costs of potential financial distress. This theory states that an optimal capital structure is reached when the marginal benefit of debt equals the marginal cost (Yakubu et al., 2021). In reality, firms compare the tax benefit of debt with the risk of bankruptcy, which may vary based on firm-specific factors such as prospects for growth and risk (Yakubu et al., 2021). These theories are basic but also present complexity and diversity in their practical applications. Although these theories give fundamental insights into capital structure decisions, the assumptions of the Modigliani-Miller theorem fail frequently, and the need for more sophisticated theories, such as the Pecking Order and Trade-off theories, arises to more effectively address market flaws and firm-specific variables.

Financial health metrics, including profitability, liquidity, and solvency, are essential for capital structure modifications. These metrics affect a company's debt and equity management to enhance financial performance and guarantee long-term sustainability. The correlation between these metrics and capital structure is intricate and differs among industries and economic contexts. The following are essential insights derived from the referenced research publications.

Profitability, often measured by Return on Assets (ROA), is one factor affecting capital structure. Improved profitability can lead to increased internal finance, reducing the need for external debt. However, some studies show a positive relationship between profitability and capital structure, as profitable firms can use debt to take advantage of tax benefits for interest payments (Sirait et al., 2024), (Faizan et al., 2024). This mediating relationship between capital structure and company value is profitable, suggesting that profitable organizations are better at managing their capital structure to augment firm value (Ningsih & Paramitha, 2019).

Liquidity affects capital structure decisions. Organizations with higher liquidity would rely less on external borrowing as they have enough internal funds to fund activities. However, the effects of liquidity on profitability and the organization's value can be adverse, thereby stating that higher liquidity may not necessarily mean better financial performance (Sirait et al., 2024), (Ningsih & Paramitha, 2019). Liquidity is an important factor for capital structure adjustments because it determines the speed and ability of a company to adjust its capital structure in response to changing financial circumstances (Bandawaty et al., 2023)

Solvency, sometimes measured through the debt-asset ratio, is important in determining a firm's capital structure. A high solvency ratio indicates that the firm relies more on debt, which can negatively impact profitability if not adequately controlled

(Sirait et al., 2024). Proper solvency control is important in determining capital structure because it influences the weighted average cost of capital and, consequently, the firm's value (Wieprow, 2017). Although these indicators are vital when evaluating capital structure, their impact may vary with industry-related variables and economic conditions. The construction industry might thus be different from telecommunications and healthcare, which also explains why industries require tailored capital structures (Faizan et al., 2024; Bandawaty et al., 2023).

Empirical works on capital structure and the dynamics of financial health over many firms show considerable variation that is industry-specific, situational, and choice-related. These studies reflect how complex capital structure decisions are and how they affect a firm's success and overall financial health. The succeeding sections discuss the key findings from the provided documents.

Higher debt ratios generally characterize capital-intensive businesses since many expenses are in fixed assets. At the same time, labor-intensive and innovative sectors are more often reliant on equity financing because of their specific operation and risk profiles (Zhang, 2024). Indian manufacturing companies are reported to have higher debt-equity ratios than service sector companies, reflecting the role of technology and external funding requirements in shaping the capital structure (Panigrahi, 2012).

An optimal capital structure requires balancing the advantages of debt, such as tax shielding, with the dangers of financial distress and agency expenses. This is important for maximizing shareholder profit and sustaining financial stability ("Optimal Capital Structure for Firm Performance: A Comprehensive Analysis," 2023). Empirical evidence suggests that companies with higher leverage than their peers in the industry are likely to face reduced sales growth and profitability, particularly during the economic recession, due to increased financial vulnerability (Ramachandra & Rao, 2008). High-growth companies typically have reduced debt and turnover, signifying an investment preference for flexibility and reduced financial risk when market conditions are unstable (Miao, 2011). The dynamics between the industry price and capital structure can impact a company's performance. Counter-cyclical markup behavior is observed in industries with high debt levels (Ramachandra & Rao, 2008).

While these studies offer significant insights into the correlation between capital structure and financial health, they underscore the constraints of universally applying mainstream financial theories. The disparities in capital structure among Indian businesses undermine the relevance of Western corporate financial theories, which indicates the need for context-specific financial decision-making strategies (Panigrahi, 2012). Companies adapt to market conditions and their financial status by balancing internal

profitability and growth prospects with external economic factors. This adaptation and modification help maintain financial stability and minimize risks in general, especially during volatile periods of economic instability. Firms use different methods to improve their capital structure, which can vary dramatically between industries and markets. The following sections explain how firms deal with these adjustments.

Firms with excellent capital structure optimization come from companies with robust financial performance, high profitability, and strong prospects for growth. These corporations can leverage their good financial stability to attain good financing terms and sustain a balanced combination of equity and debt (Bandawaty et al., 2023). Better-liquidity-managed companies and those that effectively manage taxes can better adjust the capital structure. These characteristics impact the speed and effectiveness of capital structure changes, giving organizations the flexibility to respond to changing financial situations (Bandawaty et al., 2023). In stable economic times, firms are better placed to alter their capital structure, focusing on internal factors like profitability. During recessionary periods, external macroeconomic factors become more decisive, and there is a need for strategic adjustment to cope with the volatility in the market (Choi et al., 2024). Capital-intensive industries tend to rely more on debt financing, which increases financial risk during recessions. On the other hand, labor-intensive industries tend to benefit from equity financing, which offers better operational flexibility (Li, 2024).

Companies in emerging economies often use a mix of trade-off and pecking order theories to guide their capital structure changes. The models help companies align the cost of capital with internal conflicts while considering market timing and organizational maturity (Pontoh & Budiarso, 2018). As companies strive to improve their capital structure, the complexities of market circumstances and specific firm characteristics will lead to different outcomes. The relationship between internal financial health and external economic conditions requires a subtle approach because companies must constantly amend their plans to maintain financial stability and exploit development opportunities. Financial health is crucial for evaluating long-term organizational sustainability and performance. Organizations with strong financial management procedures are better at resource allocation, risk management, and investment in sustainable initiatives, thus increasing their sustainability profiles. Including ESG aspects in the financial strategy increases long-term resilience and competitiveness. The following are the key factors of the impact of financial health on company sustainability and performance:

Efficient financial management is necessary to optimize resource allocation and ensure liquidity, which is essential for sustainability (Manaf et al., 2024). Financial planning

and control are necessary to avoid waste and implement sustainable activities, hence enhancing the sustainability of the organization (Nasution & Sibuea, 2024). Comprehensive risk management techniques enable organizations to be aware of potential dangers and opportunities, thus enabling advanced proactive control of financial risks due to environmental and social matters (Manaf et al., 2024). (Nasution & Sibuea, 2024). Investments in long-term development and sustainability, such as ESG investments, boost the resilience of businesses while garnering stakeholder's confidence (Manaf et al., 2024)

ESG aspects influence key financial indicators, such as revenue, profitability, and stock performance, and thus impact long-term sustainability and competitiveness (Jagannayaki et al., 2024). The relationship between business sustainability and financial performance is usually positive but possibly needs to catch up in time (Rahi et al., 2023). Strong corporate governance structures ensure that sustainability practices are held accountable and transparent and thus promote long-term corporate sustainability (Nasution & Sibuea, 2024). Despite financial fitness being a paramount factor of business sustainability, there still is a challenge to aligning short-term financial performance with long-term sustainability goals. Sustainability may blur the effect on financial performance, more so in economically rational capitalist countries wherein institutional and legitimacy pressures would be less than sufficient in ensuring sustained sustainability without having a robust strategy that balances the involvement of various stakeholders (Rahi et al., 2023).

Research Methodology

Data

The data sources came from 50 pharmaceutical companies over ten years, from 2014 to 2023. The dataset contains basic financial metrics relevant to understanding financial fitness's influence on capital structure. It includes financial soundness, which comes in the form of Altman Z-Score; the scale of the company, portrayed by Market Capitalisation; profitability, measured by ROA; liquidity, measured through Quick Ratio and Interest Coverage Ratio; and leverage, measured by Debt-to-Equity Ratio. Credible financial databases supplied the data, ensuring precision and consistency among all organizations. The panel structure of the dataset enabled the observation of disparities in cross-sectional and time-series data among the companies during the specified time frame.

Statistical Methods

The study used several econometric models to examine the relationship between financial health and capital structure. It first used Pooled Ordinary Least Squares and

Random Effects models to analyze the relationship over the entire sample, suppressing firm-specific effects. Then, to control for any unobserved heterogeneity and to obtain more accurate estimates, the Fixed Effects model was chosen as the best fit. This model-controlled time-invariant firm-specific attributes, distinguishing the effect of financial health on capital structure. Once it accounted for company size, profitability, and liquidity, it probed into the significance of the effect of financial health on leverage, as represented by the debt-to-equity ratio. Diagnostic tests, including Wald, Hausman, and Lagrange multiplier tests, were conducted to validate the model selection and ensure the reliability of the results. All statistical studies used standard econometric software, ensuring the results' precision and reproducibility.

Analysis and Interpretation

Table 1: Descriptive Statistics

	DEBT_TO_EQUITY_RATIO	ALTMAN_Z_SCORE	LOG__MARKET_CAPITALIZATION	ROA	QUICK_RATIO	INTEREST_COVERAGE_RATIO	EPS
Mean	47.17	2.17	4.60	8.61	1.26	92.29	31.79
Median	29.67	1.60	4.73	7.87	1.05	12.95	15.88
Maximum	1345.00	9.13	6.39	84.73	5.73	4852.42	446.80
Minimum	0.02	-0.17	1.73	-17.89	0.33	-18.54	-55.00
Std. Dev.	79.95	1.68	0.94	7.80	0.74	393.20	55.33
Observations	500	500	500	500	500	500	500

Note: Descriptive statistics for financial health and capital structure variables for 50 pharmaceutical companies over ten years.

An analysis of pharmaceutical companies' financial health and capital structure revealed that these entities often sustained a favorable level of leverage. The Altman Z-Score indicated that many enterprises resided in a state of financial stability, although a degree of distress risk existed for some. Significant disparities in market capitalization across the enterprises indicated variations in their size and market presence. Return on Assets reflected adequate profitability relative to the industry. However, there were negative returns for some companies. Quick Ratio indicated that many companies reflected adequate liquidity positions and could meet short-term obligations. The high variation of the Interest Coverage Ratio reflected that although several companies efficiently managed their interest payments, others could not. Ultimately, the high variability of Earnings per Share signified differences in profitability between the analyzed organizations.

Table 2: Correlation Metrics

Variable	DEBT_TO_EQUITY_RATIO	ALTMN_Z_SCORE	LOG_MARKET_CAPITALIZATION	RETURN_ON_ASSETS (ROA)	QUICK_RATIO (x)	INTEREST_COVERAGE_RATIO (x)	EARNINGS_PER_SHARE (EPS)
DEBT_TO_EQUITY_RATIO	1						
ALTMAN_Z_SCORE	-0.408 ***	1					
LOG_MARKET_CAPITALIZATION	-0.232 *** (-5.32)	0.170 *** -3.85	1				
RETURN_ON_ASSETS (ROA)	-0.376 *** (-9.05)	0.446 *** -11.11	0.210 *** -4.8	1			
QUICK_RATIO (x)	-0.231 *** (-5.29)	0.700 *** -21.82	0.123 ** -2.76	0.338 *** -8.01	1		
INTEREST_COVERAGE_RATIO (x)	-0.121 ** (-2.71)	0.387 *** -9.35	0.116 ** -2.6	0.281 *** -6.53	0.421 ***_ 10.34	1	
EARNINGS_PER_SHARE (EPS)	-0.120 ** (-2.69)	0.172 *** -3.9	0.325 *** -7.67	0.443 *** -11.02	0.306 ***-7.16	0.105 * -2.35	1

Note: Correlation coefficients which are shown in the table with t-statistics enclosed in parenthesis. Significance level are shown as follows:

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$; non-significance is indicated by $p>0.10$.

Correlation research indicated that most financial health indices, such as Altman Z-Score, Market Capitalisation, Return on Assets, Quick Ratio, Interest Coverage Ratio, and EPS, displayed a negative association with the debt-equity ratio. The negative associations indicated that when the financial health indices of pharmaceutical companies improved, their leverage diminished. On the contrary, some positive relationships emerged between the financial health measures, and improved performance in one area of financial health often was linked to improvements in others. As multiple constant correlations exist among the variables, linear modeling may be appropriate for further research.

Model Selection

Table 3: Lagrange Multiplier Tests for Random Effects

Est	Hypothesis	Cross-Section	p-value	Time	p-value	Both	p-value
Breusch-Pagan	No Effects	37.48	< .001	0.79	0.375	38.27	< .001
Honda	Two-Sided (Breusch-Pagan)	6.12	< .001	0.89	0.188	4.96	< .001
King-Wu	One-Sided	6.12	< .001	0.89	0.188	3.23	< .001
Standardized Honda	Standardized	6.77	< .001	1.2	0.115	0.07	0.472
Standardized King-Wu	Standardized	6.77	< .001	1.2	0.115	-0.6	0.726
Gourieroux, et al.	No Effects (Both)	--	--	--	--	38.27	< .001

Note: The null hypothesis is "No Effects". The tests compares cross-sectional and time effects using different statistical methodologies. The p-values indicate the significance of these effects.

Table 4: Correlated Random Effects - Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	p-value
Cross-section random	25.28	6	0.0003

Table 5: Wald Test

Test Statistic	Value	DF	p-value
F-statistic	32.96	(3, 443)	< .001
Chisquare	98.87	3	< .001

Note: Wald Test used for confirming fitness of FEM

The fixed effects model was the best choice because of the results of many tests conducted to determine the most suitable model for data interpretation. The Lagrange Multiplier Tests (Table 3) showed significant cross-sectional effects, meaning that there is unobserved heterogeneity among firms. The Hausman Test confirmed this, indicating a preference for the fixed effects model and revealing a significant disparity between the fixed and random effects models (Table 4). The Wald Test (Table 5) confirmed the fixed effects model's robustness, which confirmed the combined importance of the variables. Therefore, based on these tests, the fixed effects model was deemed the most appropriate for the investigation.

Table 6: Model Estimation

Variable / Statistic	Pooled OLS	Random Effects	Fixed Effects
ALTMAN_Z_SCORE	-16.79 ***	-17.70 ***	-15.92 ***
	(-5.94)	(-5.33)	(-3.37)
LOG_MARKET_CAPITALIZATION	-13.54 ***	-18.44 ***	-56.25 ***
	(-3.81)	(-3.81)	(-5.18)
RETURN_ON_ASSETS (ROA)	-2.71 ***	-2.90 ***	-2.80 ***
	(-5.42)	(-5.73)	(-5.01)
QUICK_RATIO (x)	7.7	15.72 **	24.28 ***
	-1.21	-2.32	-3.04
INTEREST_COVERAGE_RATIO (x)	0.01	0.01	0.00
	-1.59	-0.93	-0.34
EARNINGS_PER_SHARE (EPS)	0.12 *	0.12	0.14
	-1.71	-1.61	-1.51
Constant	154.34 ***	170.76 ***	328.94 ***
	-9.08	-7.62	-6.97
R^2	0.25	0.2	0.44
Adjusted R^2	0.24	0.19	0.37
SE of Regression	69.84	64.8	63.57
F-statistic	26.77 ***	20.62 ***	6.27 ***
Prob(F-statistic)	< 0.01	< 0.01	< 0.01
Durbin-Watson stat	1.73	1.83	1.94

*Note: The table presents coefficients with t-statistics in parentheses. Significance levels are indicated as follows: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$; $p > 0.10$ denotes non-significance.*

The analyses in Tables 3, 4, and 5 validate that the fixed effects model offered the most robust framework for addressing the research topic in the study. The Altman Z-Score emerged as the principal variable of interest for analyzing the association

between financial health and capital structure in the pharmaceutical sector in the fixed effects model. The Altman Z-Score is one of the well-established measures of a firm's financial health, particularly about bankruptcy risk. This research found a strong negative correlation between the Altman Z-Score and the loan-to-equity Ratio, indicating that pharmaceutical companies with more substantial financial health generally relied less on loan financing. This conclusion is consistent with the general financial concept that more financially stable companies prefer conservative capital structures, thus reducing their dependence on debt because of their ability to generate sufficient internal cash in the pharmaceutical industry, where there are significant research and development costs and variable cash flow, maintaining a low level of debt is crucial to supporting operations while reducing financial risk. The Altman Z-Score is crucial in determining the capital structure decisions of pharmaceutical companies. Companies with high Z-Scores, which indicate lower financial distress, are more likely to adopt strategies that reduce debt usage to avoid the costs associated with financial distress, such as bankruptcy and the subsequent loss of market confidence. This conservative capital structure approach is particularly relevant in the pharmaceutical industry, wherein an excellent financial situation plays a critical role in funding long-term projects, including the development of drugs, that entail significant and continuous investments. Therefore, the results of this research highlight the role of financial well-being as a vital consideration that influences how pharmaceutical companies manage their capital structure, hence influencing the ability to balance debt with equity in funding activities.

In controlling other variables such as Market Capitalisation, Return on Assets, Quick Ratio, Interest Coverage Ratio, and Earnings per Share, the attempt is to isolate the influence that the Altman Z-Score has on the estimation of the Debt-to-Equity Ratio. Controlling variables was essential because other factors influencing a company's leverage should maintain the linkage between financial health and capital structure. Market Capitalization and Return on Assets indicate the company's size and profitability, respectively, impacting the ability to secure funding. Considering these features, the study better-matched changes in the debt-to-equity ratio with changes in financial health from the Altman Z-Score rather than other effects.

The fixed effects model performed exceptionally well in terms of its performance metrics, thus indicating its use for this study. The R-squared value was high enough to indicate that the model explained much of the variance in the Debt-to-Equity Ratio, thus suggesting that the variables included represented the key drivers of capital structure in the pharmaceutical industry. The high F-statistic, along with the associated p-value, confirmed the significance of the total model and that, therefore, the result is reliable. The Durbin-Watson statistic also revealed minor concerns regarding autocorrelation

within the residuals. It reported no major issue in such regard, meaning the model is adequately described, and the outcome is free from serial correlation influence. These indicators confirmed that the fixed effects model was a statistically and theoretically robust option for analyzing the impact of financial health on capital structure within the pharmaceutical business, which was important for stakeholders in this field.

The correlation of the Debt-to-Equity Ratio with the Altman Z-Score and control variables was investigated through Pooled OLS and Random Effects models. In both models, the Altman Z-Score strongly negatively correlates with the Debt-to-Equity Ratio, indicating that better financial health is associated with lesser leverage. The control factors of Market Capitalisation, Quick Ratio, Interest Coverage Ratio, ROA, and EPS have also influenced the Debt-to-Equity Ratio with moderate differences in the results between the two models. The Pooled OLS model treated all data points as a single cross-section, which may miss out on firm-specific effects. In contrast, the Random Effects model considers inter-firm variability but assumes that the unobserved effects are not correlated with the independent variables. Both the models reflected an enduring negative influence of leverage on financial health. However, in this, a better fit is delivered in Random Effects, accounting for the variations at cross sections.

Table 7: Residual Cross-Section Dependence Test

Test	Statistic	D.F	p-value
Breusch-Pagan LM	9.25	1225	0.7432
Pesaran scaled LM	0.58		0.5637
Bias-corrected scaled LM	0.42		0.6729
Pesaran CD	0.94		0.3471

Note: The table presents results from the Residual Cross-Section Dependence Test, where the null hypothesis is that there is no cross-section dependence (correlation) in the residuals.

Table 7 presents the results of the Residual Cross-Section Dependence Test. It shows that the fixed effects model did not reveal significant cross-sectional dependence since all p-values are above the conventional significance levels. This means that residuals were uncorrelated across the different cross-sections, affirming the appropriateness of the fixed effects model for this study. The absence of cross-sectional dependence enhances the robustness of the model in precisely delineating the relationship between financial health and capital structure in the pharmaceutical sector.

Findings and Suggestions

1. Based on available data, companies maintained an appropriate level of leverage; satisfactory profitability existed in the form of the Return on Assets, but some firms resulted in losses.
2. The high swing of the Interest Coverage Ratio confirmed profit-based returns for this case. However, only a few firms were doing well regarding interest payment management.
3. The correlation study indicated a strong negative correlation between the Debt-to-Equity Ratio and many other measures of financial health, including the Altman Z-Score, Market Capitalisation, Return on Assets, Quick Ratio, and Interest Coverage Ratio.
4. Several tests were conducted to identify the best model for the data, but the fixed-effects model was chosen as the most appropriate for the study at hand.
5. A significant inverse relationship was found between the Altman Z-Score and the Debt-to-Equity Ratio; that is, pharmaceutical companies in better financial health typically employ less debt financing.
6. In the Pooled OLS and Random Effects models, the Altman Z-Score has an extremely negative relationship with the Debt-to-Equity Ratio; better financial health correlates with lower leverage.
7. While both models showed a persistent negative effect of financial health on leverage, the Random Effects model, by incorporating cross-sectional variations, provided more nuanced insight.

Conclusion and Implications

The study concluded that financial health, as rated by the Altman Z-Score, had a significant adverse effect on the capital structure of pharmaceutical companies. Pharmaceutical companies with higher levels of financial stability relied less on debt and favored more conservative capital structures. The analysis indicated that even though control variables such as Market Capitalisation, Return on Assets, and liquidity ratios affected the Debt-to-Equity Ratio, the financial soundness of the enterprises was the paramount issue. This link was repeatedly found across many models, with the fixed effects model yielding the most precise and dependable results.

These results have significant implications for management and pharmaceutical industry investors. Companies should maintain sound financial health to reduce their reliance on debt and minimize financial risk. For investors, understanding a company's

financial health can provide important insight into its capital structure decisions and future risk levels. This knowledge can inform investors' strategies and alert them to organizations that manage their leverage well, avoiding exposure to financially shaky entities.

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