

Financial Health and Firm Valuation: Evidence from Indian Pharmaceutical Firms Using Panel Data Analysis

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Abstract: This paper look at how financial health and dividend policy affects the value in the market of pharmaceutical companies listed in the Bombay Stock Exchange (BSE). Working with a dataset of 71 firms that are balanced by a panel of firms between the years 2014-2023, the research used panel data regressions to determine the relationship between financial stability, paying dividends, and the valuation of the firm. The Altman Z-score is used to measure the financial health whereas the natural logarithm of market capitalization is used to proxy market value. The empirical findings shows that financial health positively and statistically significantly influences firm value, which implies that firm value is more likely to be drawn to financially stable firms. Equally, in the fixed effects model, dividend payout ratio is inconsistent and statistically insignificant with market value. Firm size and firm age have a positive relationship with valuation followed by negative effects on leverage and liquidity as some of the control variables. It is also observed that the COVID-19 period had a negative long-lasting effect on the valuation of the firms. On balance, the paper demonstrates that financial stability and firm specific features are more important in the market value determination, and recommends a weak impact of dividend policy in the pharmaceutical industry.

Keywords: Financial Health; Firm Valuation; Dividend Policy; Altman Z-Score; Panel Data; Pharmaceutical Sector; Market Capitalization **JEL Classification:** G32, G35, C23

1 Introduction

The price of companies in financial markets has been a major issue within the field of corporate finance, and more so to determine the determinants that are of most importance in market capitalization and the perception of the investors. The financial health and dividend policy are among these determinants which are said to be the key indicators of the stability, performance and the long term sustainability of a given firm. Financial health describes how a firm is capable of covering its financial payments and does not get in distress, whereas dividend policy indicates how the management is sure of its earnings and cash flow going forward (Altman et al., 2017; Gordon, 1963).

The pharmaceutical sector plays a strategic role in the growth of emerging economies like India because it helps in providing healthcare, exporting as well as growth of the economy. The industry has exhibited massive growth within the last twenty years, which has been reinforced by the high demand of generic drugs, low cost production capacity, and growing globalization factors. Nevertheless, in spite of its increasing trend, pharmaceutical companies are rather heterogenous in terms of financial performance, capital structure and market valuation, which makes it necessary to empirically inquire more about the factors of firm value determinacy in the given industry.

The use of financial health, which is commonly determined through composite indicators like the Altman Z-score, has been widely utilized in the literature as a factor to determine the stability of firms and to predict financial distress. According to the previous research, firms with a good financial health are more likely to appeal to the investor confidence leading to better market valuation (Altman et al., 2017; Chouhan et al., 2014). Simultaneously, dividend policy is one of the controversial variables of corporate finance theory. According to classical theories

including, the dividend relevance theory, the payment of dividends affects the value of a firm by indicating profitability, as well as by dispelling information asymmetry (Lintner, 1956; Gordon, 1963). Contrary, according to the dividend irrelevance proposition, decisions regarding dividends do not necessarily have a substantial impact on the valuation of firms under specific market conditions.

Firm-specific factors like size, leverage, liquidity, age, and growth prospects are also important aspects of the market value in addition to financial health and dividend policy. Typically, larger companies enjoy economies of scale and greater market credibility and overly leveraged investments can elevate the financial risk level and worsen valuation (Fama and French, 1992; Desai and Desai, 2018). Likewise, liquidity and the age of the firms could modify the investor perception but the growth indicators may not necessarily have a positive co-relationship with the market capitalization.

Although a long literature has been done in the field of firm valuation, there is a paucity of empirical studies in the study that have directly looked at the joint effect of financial health, dividend policy, and firm characteristics on the market value of pharmaceutical firms in the Indian context using the panel data methods. In addition, the dynamism of the pharmaceutical industry, which is affected by the changes in regulations, the intensity of innovation, and the competition on the global level, requires sector-related analysis to capture valuable information.

It is against this background that this research will seek to investigate the effect of financial health and dividend policy on the market value of pharmaceutical companies that are listed on the Bombay Stock Exchange (BSE). The analysis uses the panel data regression methodology on a balanced sample of 71 firms between the year 2014 and 2023 which has allowed ample analysis of cross sectional and time series changes in firm performance.

This study has threefold contribution. First, it offers empirical studies of the financial health as a firm-value determinant in the pharmaceutical industry. Second, it examines whether dividend policy is pertinent in affecting market capitalization in an emerging market. Third, it incorporates the firm specific features into the analysis, providing a complete model of the motivation of the firm valuation.

The rest of the paper has the following structure. The literature review on the relevant literature comes next, and the methodology and specification of the research model is then provided. The following parts provide the empirical findings and discussion and the paper ends with summary findings and implications.

2 Review of Literature

The connection between financial health, dividend policy, and firm valuation is the topic that has been analyzed in the literature of corporate finance. Nevertheless, the empirical data is still inconclusive especially in terms of sectors and new market environments. This section conducts a review of the literature that has been done by classifying the existing studies into three general themes: financial health and firm value, dividend policy and firm valuation, and the role of firm-specific characteristics.

The financial health is a smart topic to which a considerable amount of research has been devoted as a predictor of firm performance and valuation. The Altman Z-score model, which is an instrument of financial distress prediction, has been extensively used in industries and nations. Research like Altman et al. (2017) has shown that companies that have better Z-scores are financially stable and have reduced risk of bankruptcy, which has a positive effect on investor trust and market. Equally, Chouhan et al. (2014) used the Z-score model on Indian companies and discovered that companies endowed with the financial stability are more likely to have better operational and market performance. These results imply that financial health is a very important factor in determining the firm valuation by minimizing the perceived risk and maximizing credibility in capital markets.

Regarding dividend policy, classical theories offer opposite views of the dividend policy in respect to firm value. According to Lintner (1956) and Gordon (1963), dividend payment is considered to give a signal of profitability and future stability of earnings, which is likely to positively affect the valuation of a firm. This effect of signaling is especially significant in markets where there is asymmetry in information. Empirical evidence like that by Hussain and Akbar (2022) also points out that agency costs and financial constraint are also determinants of dividend policy, and consequently have an impact on investor perception. Nevertheless, according to other studies dividend policy can be not very significant or less predictable to the value of firm particularly when other firm and market specific factors are considered.

Firm specifics have also been pointed out as significant determinants of market worth. Fama and French (1992) stress on the impact of firm size in the explanation of the variation in stock returns and market valuation, pointing out that larger firms gain advantage of increased visibility, access to resources and confidence of investors. On the same note, leverage has been established to be negatively correlated with firm value as it introduces greater financial risk and the risk of distress (Desai and Desai, 2018). Although it is crucial to fulfill short-term liabilities, it is unclear how liquidity can affect valuation because too much liquid assets can reflect poor resource management (Nasiya, 2023). Operational stability and reputation (which is largely determined by age of a firm) may positively affect the market value (Sur and Chakraborty, 2006).

In pharmaceutical industry, the literature has majorly concentrated on monetary achievement, capital structure as well as the dividend choices. As an example, Chaudhary (2021) investigated the connection between financial health and dividend payout among Indian pharmaceutical companies and discovered that financial indicators are strongly related to dividend practices. In the same way, Basse et al. (2023) emphasized that profitability and the nature of the firm were significant in the establishment of dividend policies among pharmaceutical firms. The majority of these studies however examine the individual relationships independently as opposed to giving a combined framework that relates financial health, dividend policy and market value.

Moreover, the effect of external shocks, in particular the COVID-19 pandemic on firm performance and financial stability was examined in recent research. According to studies like Ramprakash and Arun (2022), the pandemic disrupted the performance of firms across the board because of economic shocks, whereas Aravind and Manojkrishnan (2020) found that pharmaceutical firms showed more resilience than other businesses. These results highlight the need to investigate the issue of firm valuation in the context of a changing and dynamic economic landscape.

Although there is widespread literature, a research gap has nonetheless been identified. To begin with, there is paucity of research that has concurrently investigated the joint effects of financial health, dividend policy and firm specifications on firm valuation, especially in the pharmaceutical industry. Second, the majority of the studies in the Indian environment are based on cross-sectional or temporary data, which makes it impossible to trace dynamic relationships over time. Third, no studies of panel data cover in-depth extensive studies to combine several financial indicators to justify market value within a sector-specific framework.

To fill these gaps, the current study embraces a panel data model to reveal the effect of financial health, dividend policy, and firm characteristics on the market value of the Indian pharmaceutical firms. The study will offer strong empirical support and add to the body of literature on the issue of corporate finances and firm valuation by including a multi-year dataset and a comprehensive pool of variables.

3 Research Methodology

This section outlines the research design, data structure, variable measurement, and econometric model employed to examine the impact of financial health and dividend policy on firm valuation.

3.1 Research Design and Data Structure

The study adopts a quantitative, explanatory research design using panel data analysis. Panel data enables the integration of cross-sectional (firms) and time-series (years) dimensions, thereby improving estimation efficiency and controlling for unobserved heterogeneity (Wooldridge, 2010).

The empirical analysis is based on a balanced panel dataset of 71 pharmaceutical firms listed on the Bombay Stock Exchange (BSE) over the period 2014–2023, resulting in 852 firm-year observations.

3.2 Variables of the Study

The study examines the relationship between financial health, dividend policy, and firm valuation by categorizing variables into dependent, independent, control, and dummy variables.

Table 1: Operational Definition and Measurement of Variables				
Category	Variable Name	Symbol	Measurement / Formula	Nature
Financial Health	Altman Z-Score	ZS	$Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 1.0X_5$	Independent
Dividend Policy	Dividend Payout Ratio	DPR	Dividend / Net Profit	Independent
Market Value	Market Capitalization	ln_mcap	ln (Share Price × Outstanding Shares)	Dependent
Firm Size	Firm Size	FS	ln (Total Assets)	Control
Capital Structure	Leverage	Lev	Total Liabilities / Total Assets	Control
Liquidity	Current Ratio	CR	Current Assets / Current Liabilities	Control
Firm Characteristics	Firm Age	FA	Current Year – Incorporation Year	Control
Growth	Sales Growth	SG	$(Sales_t - Sales_{t-1}) / Sales_{t-1}$	Control
External Shock	COVID Dummy	C_Dum	1 = COVID/Post, 0 = Pre-COVID	Dummy
Note: Financial data are obtained from company financial statements and BSE-related sources. The natural logarithm is used to normalize scale differences across firms. <i>Source: Author's own</i>				

3.3 Measurement of Financial Health

The financial health of firms is measured using the Altman Z-score model, which combines multiple financial ratios to assess bankruptcy risk and solvency.

Equation 1: Altman Z-Score Model

$$Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 1.0X_5$$

Where:

- $X_1 = \frac{\text{Working Capital}}{\text{Total Assets}}$
- $X_2 = \frac{\text{Retained Earnings}}{\text{Total Assets}}$
- $X_3 = \frac{\text{EBIT}}{\text{Total Assets}}$
- $X_4 = \frac{\text{Market Value of Equity}}{\text{Total Liabilities}}$
- $X_5 = \frac{\text{Sales}}{\text{Total Assets}}$

3.4 Econometric Model Specification

To examine the impact of financial health and dividend policy on firm valuation, the study employs panel regression techniques.

Equation 2: Panel Regression Model

$$\ln(MCAP_{it}) = \beta_0 + \beta_1 ZS_{it} + \beta_2 DPR_{it} + \beta_3 FS_{it} + \beta_4 Lev_{it} + \beta_5 CR_{it} + \beta_6 FA_{it} + \beta_7 SG_{it} + \beta_8 C_Dum_{it} + \varepsilon_{it}$$

Where:

- i =firm
- t =time
- ε_{it} =error term

3.5 Estimation Techniques

The study employs three panel data estimation approaches:

Table 2: Panel Data Estimation Techniques		
Model	Description	Purpose
Pooled OLS	Ignores firm heterogeneity	Baseline estimation
Fixed Effects (FE)	Controls for firm-specific effects	Preferred model
Random Effects (RE)	Assumes random variation across firms	Comparative model
Note: The Hausman test is used to select between Fixed Effects and Random Effects models.		
Source: Author's own		

3.6 Diagnostic Tests

To ensure robustness and validity of results, several diagnostic tests are conducted.

Table 3: Diagnostic Tests		
Test	Purpose	Interpretation
Hausman Test	Model selection (FE vs RE)	Significant → FE preferred

VIF	Multicollinearity check	VIF < 10 acceptable
Heteroskedasticity Test	Variance consistency	If present → use robust SE
Serial Correlation Test	Time correlation	If present → adjust errors
Cross-Section Dependence	Inter-firm dependence	If present → robust model
Note: Robust standard errors are applied in the final model to correct for heteroskedasticity, autocorrelation, and cross-sectional dependence.		
<i>Source: Author's own</i>		

3.7 Hypotheses Development

Based on theoretical and empirical literature, the following hypotheses are formulated:

- **H1:** Financial health significantly influences market value
- **H2:** Dividend payout ratio significantly influences market value
- **H3:** Firm size significantly influences market value
- **H4:** Leverage significantly influences market value
- **H5:** Liquidity significantly influences market value
- **H6:** Firm age significantly influences market value
- **H7:** Sales growth significantly influences market value
- **H8:** COVID-19 period significantly influences market value

4 Empirical Results and Discussion

This section presents the empirical findings of the study, including descriptive statistics, correlation analysis, and panel regression results examining the impact of financial health and dividend policy on firm valuation.

4.1 Descriptive Statistics

Descriptive statistics provide an overview of the central tendency and dispersion of the variables used in the analysis. The statistics are based on 852 firm-year observations, offering insights into the financial characteristics of pharmaceutical firms.

Table 4: Descriptive Statistics				
Variable	Mean	Std. Dev.	Min	Max
ZS	5.455	5.243	-11.435	41.600
DPR	0.131	0.235	-0.554	1.403
FS	5.984	1.953	-4.605	10.054
Lev	0.151	0.150	0.000	0.685
CR	2.659	1.931	0.070	15.836
FA	38.021	17.092	4	90

SG	0.096	0.215	-0.499	0.908
ln_mcap	6.481	2.681	-0.037	12.939

Note: ZS = financial health (Altman Z-score); DPR = dividend payout ratio; FS = firm size; Lev = leverage; CR = current ratio; FA = firm age; SG = sales growth; ln_mcap = natural log of market capitalization.

Source: Author's own

The results indicate that firms, on average, exhibit strong financial health, as reflected by a relatively high mean Z-score. However, the wide dispersion suggests heterogeneity in financial stability across firms.

4.2 Correlation Analysis

Correlation analysis is conducted to examine the pairwise relationships among the variables and to assess preliminary associations before regression analysis.

Table 5: Correlation Matrix								
Variable	ZS	DPR	FS	Lev	CR	FA	SG	ln_mcap
ZS	1							
DPR	0.189	1						
FS	0.323	0.190	1					
Lev	-0.478	-0.158	-0.084	1				
CR	0.481	0.084	0.059	-0.547	1			
FA	0.174	0.131	0.233	-0.244	0.205	1		
SG	0.111	-0.045	0.112	-0.048	0.008	-0.013	1	
ln_mcap	0.502	0.278	0.904	-0.220	0.149	0.273	0.096	1

Source: Author's own

The results show a positive association between financial health and market value, indicating that financially stable firms tend to have higher valuation. Firm size exhibits a strong positive correlation with market capitalization, while leverage shows a negative relationship.

4.3 Multicollinearity Test

To ensure that the regression model is not affected by multicollinearity, the Variance Inflation Factor (VIF) is examined.

Table 6: Variance Inflation Factor (VIF)	
Variable	VIF
ZS	1.627
DPR	1.273
FS	1.466
Lev	1.668

CR	1.608
FA	1.156
SG	1.031
C_Dum	1.089
Note: VIF values below 10 indicate absence of serious multicollinearity.	
Source: Author's own	

The results confirm that multicollinearity is not a concern, as all VIF values are within acceptable limits.

4.4 Panel Regression Results

Panel regression analysis is conducted to examine the impact of financial health, dividend policy, and firm characteristics on market value.

Table 7: Panel Regression Results				
Variable	Pooled OLS	Fixed Effects	Random Effects	Robust FE
ZS	0.111***	0.088***	0.094***	0.088***
DPR	0.656***	0.061	0.233**	0.061
FS	1.091***	0.272***	0.662***	0.272***
Lev	-0.829***	-1.033***	-1.382***	-1.033***
CR	-0.063***	-0.064***	-0.051***	-0.064***
FA	0.005**	0.173***	0.042***	0.173***
SG	-0.230	0.036	-0.177*	0.036
C_Dum	0.049	-0.547***	0.011	-0.547***
R ²	0.877	0.659	0.618	0.659
Note: ***, **, * indicate significance at 1%, 5%, and 10% levels respectively. Robust FE is considered the final model.				
Source: Author's own				

4.5 Discussion of Results

The regression findings give a number of valuable clues regarding the predictors of firm valuation in the pharmaceutical industry.

- **Financial Health (ZS):** All the models show that the coefficient is positive and significant, which means that financially stable companies are valued higher in the market. This helps to make a point that financial stability minimizes perceived risk and investor confidence rises.
- **Dividend Payout Ratio (DPR):** This is a positive variable in pooled model; however, it does not have significance in the fixed effects model, which implies that dividend policy does not invariably affect firm valuation when we include other firm specific variables.

- **Firm Size (FS):** There is a strong positive correlation which proves that larger firms enjoy the advantage of increased credibility in the market and trust by investors.
- **Leverage (Lev):** The negative and significant coefficient depicts that the increase in the debt levels causes a decrease in the value of the firm because of the increased financial risk.
- **Liquidity (CR):** The relationship between Liquidity and the other variables is negative and this implies that high liquidity can indicate poor utilization of resources.
- **Firm Age (FA):** Positive and significant value shows that older firms have the benefit of reputation and strong stability of operations.
- **Sales Growth (SG):** The coefficient does not have any significant significance, which means that short-term growth does not have a significant effect on market valuation.
- **COVID Dummy (C_Dum):** The value of the negative and significant coefficient means that the pandemic negatively affected the firm value and this effect is expanded throughout the whole market.

4.6 Hypotheses Testing Summary

Table 8: Hypotheses Testing Results		
Hypothesis	Statement	Result
H1	Financial health → Market value	Supported
H2	Dividend payout → Market value	Partially Supported
H3	Firm size → Market value	Supported
H4	Leverage → Market value	Supported
H5	Liquidity → Market value	Supported
H6	Firm age → Market value	Supported
H7	Sales growth → Market value	Not Supported
H8	COVID effect → Market value	Supported
Note: Results are based on the robust fixed effects model.		
Source: Author's own		

5 Conclusion

The paper has discussed how financial health and dividend policy influence market value of pharmaceutical companies listed on Bombay Stock Exchange through panel data. Using a balanced sample composed of 71 companies between 2014 and 2023, the research has strong empirical support on the factors of firm valuation in the pharmaceutical industry.

The results indicate that financial health significantly contributes to the value of firms and the Altman Z-score has a positive and statistically significant correlation with market capitalization. This means that the financially stable companies can be considered to be less risky and attractive to investors which results in an increase in valuation. Contrary to this, dividend payout ratio has a weak and poor relationship with market value which indicates that dividend policy is not a major determinant of valuation after firm-specific effects have been removed.

Firm size and firm age are associated with positive impacts on the market value which makes these two control variables important as they show the significance of the scale, experience and reputation of the firm in the market. Leverage and liquidity on the other hand demonstrate negative correlations, which implies that high debt and poor use of the resources can negatively influence the valuation of the firm. The findings also indicate that the increase in sales does not affect the value of the market significantly which means that the short-term indicators of growth might not greatly affect the perception of the investors.

Also, the analysis establishes that the COVID-19 period negatively affected the firm valuation which is a wider economic uncertainty and break in financial markets even though the pharmaceutical sector is comparatively resilient.

Generally, the paper indicates that in the pharmaceutical industry, financial strength and firm-specific factors lead to firm value more significantly than dividend disbursement strategies.

6 Managerial and Policy Implications

- The study results offer combined knowledge to both the corporate managers and policymakers:
- Companies must focus on being in good financial position since it gives it a high market value and boosts investor trust. This implies the necessity of a wise financial management and constant control of the indicators of solvency.
- The capital structure should be managed effectively, since overdependence on debt has negative impact on the value of the firm. To reduce the financial risk, both managers and the regulators should encourage balanced financing decisions.
- Firms are supposed to make sure that they utilize resources optimally and do not have excessive liquidity which is a sign of inefficient operations. Effective expenditure of the funds can enhance the performance of operations and investor perception.
- The focus must be on the long-term stability and sustainable development as shown in the form of the size and experience of the firms. Long term planning and performance is more important than temporary finances.
- Enhancing the financial transparency, disclosure principles and resiliency frameworks is essential, especially within the environment of external shocks like COVID-19. Better governance and regulative backing can help to increase the efficiency of the markets and investor confidence.

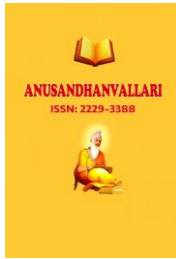
7 Theoretical Contribution

The research would help to advance the body of knowledge in corporate finance in the following aspects:

- It gives industry specific evidence regarding the importance of financial health in firm value determination.
- It revisits the applicability of dividend policy in an emerging market setting, which has minimal impact in a panel setting.
- It combines several financial and firm-specific variables into a single panel framework of data.
- It builds on the already existing literature by including the COVID-19 effect as an external shock variable.

8 Limitations and Scope for Future Research

In spite of its contributions, the study is limited in some ways:



- The study is confined to BSE-pharmaceutical companies that can limit its applicability.
- The research is based on secondary financial data which can contain inconsistencies on reporting.
- Others that include corporate governance, innovation, and macroeconomic are omitted as important variables.

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