



HETEROGENEOUS EFFECTS OF FOREIGN INSTITUTIONAL INVESTMENT ON INDIAN PHARMACEUTICAL COMPANIES: A COMPANY-WISE COMPARATIVE STUDY

Divyashree T¹, Dr. Nischith S²

¹Faculty, Department of Business Administration, Sira PG Center, Sira, Tumkur university, Tumkur

²Faculty, Department of Business Administration, BIMS, University of Mysore, Mysore

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1. ABSTRACT

In this research, we evaluated the varied effects of Foreign Institutional Investment on the financial results experienced by ten selected pharmaceutical firms located in India. The period of analysis contained quarterly information concerning twenty-four quarters, beginning from FY 2020-21 to FY 2025-26 regarding the companies, including Sun Pharmaceutical Industries, Dr Reddy's Laboratories, Cipla, Divi's Laboratories, Lupin, Torrent Pharmaceuticals, Zydus Lifesciences, Biocon, Aurobindo Pharma and Glenmark Pharmaceuticals. In this respect, we viewed FII/FPI holdings as the primary independent variable, and Revenue from Operations, Profit after Tax, Basic Earnings per Share, Share Price and Market Capitalization as two forms of accounting and market performance respectively. To assess how institutional investment influenced companies, we employed Pearson's correlation and company-wise ordinary least squares regression, in order to understand how institutional investment changes are influencing companies. The analysis found wide variation among companies. For instance, Dr Reddy's, Lupin, Torrent and Aurobindo had a broad positive impact, while Cipla showed large changes in revenue and market valuation but no changes in profitability. Sun Pharma and Zydus had higher market than accounting effects. Divi's experienced significant negative impact, while Biocon and Glenmark had negative or weak results. Tests conducted confirmed that selected models may experience autocorrelation, non-normality and heteroscedasticity, but multicollinearity was not confirmed. Conclusively, it can be mentioned that the role of FII can be considered as a company-specific factor.

KEYWORDS: Foreign Institutional Investment, Pharmaceutical Companies, Accounting Performance, Market Valuation, Heterogeneous Effects.

2. INTRODUCTION

Foreign Institutional Investors and Foreign Portfolio Investors play a vital role in the Indian equity market. Their involvement leads to a decrease in liquidity and aids in price discovery while at the same time having a profound influence on the way domestic investors view companies in terms of their financial capabilities and their future. Many institutional investors favor the pharmaceutical sector because of its export potential, research capability, product diversification along with global demand and defensive qualities.

However, the influence of the institutional owners doesn't affect all firms in a uniform way. An increased holding by FII/FPI may bring higher revenue, profitability and market capitalization in one company but may not lead to desirable results in the other. This happens due to differences between the companies, which can vary according to size, range of products, intensity of research, exposure to regulations, dependence on exports, profitability, expectations of investors, and corporate strategies.

The present study covers ten Indian pharmaceutical companies, and for each of them, data for 24 quarters from FY 2020-21 to FY 2025-26 was collected. The FII/FPI holdings are then compared with three accounting indicators of performance: Revenue from Operations, Profit after Tax and Basic EPS and two market indicators of performance: Share Price and Market Capitalization, thus allowing for a company approach that greatly helps in revealing the heterogeneous influence of institutional owners.

3. REVIEW OF LITERATURE

3.1 Bhaumik, Driffield and Pal (2010)

The research undertaken by Bhaumik, Driffield, and Pal titled "Does Ownership Structure of Emerging-Market Firms Affect Their Outward FDI? The Case of the Indian Automotive and Pharmaceutical Sectors" looked into the impact of ownership structure on internationalization of Indian firms. The authors distinguished the effect of family ownership, ownership concentration, and the involvement of foreign investors on a firm's propensity to engage in outward FDI through firm-level data analysis. The findings indicate that family firms and companies owned by relatives are less likely to invest abroad, while the presence of foreign investors can have a positive effect on the international expansion of businesses..



3.2 Purkayastha, Manolova and Edelman (2020)

The authors Purkayastha, Manolova and Edelman in their research paper Innovation and Internationalization in the Indian Pharmaceutical Sector: The Moderating Role of Ownership Structures have studied the interplay between research intensity, ownership structure and internationalization. The paper analysed 616 firm-year observations for 88 Indian pharmaceutical companies engaged in research. The random-effects methodology with two-stage least squares was used to analyze the data. The results showed that research intensity contributes positively to internationalization, while family ownership acts as a moderator between research expenses and internationalization. On the flip side, foreign corporate and institutional ownership does not play a significant moderating role, suggesting that the effect of foreign ownership depends on the characteristics of a specific company.

3.3 Behera and Rath (2021)

Behera and Rath, in their paper titled The COVID-19 Pandemic and Indian Pharmaceutical Companies: An Event Study Analysis, studied the stock-market response of Indian pharmaceutical firms in light of the pandemic. Using event-study methodology to estimate abnormal and cumulative abnormal returns, the authors report that while the pharmaceutical sector has produced positive averages returns, the magnitude and emphatic tendencies of such returns are quite variable across firms. The results make it clear that even among companies in the same industry the responses to the same market event are different..

3.4 Lobo and Bhat (2024)

Lobo and Bhat studied the determinants of investment behavior in pharmaceutical shares through their study "Unveiling Investor Behavior: An Investigation into India's Pharmaceutical Sector during COVID-19." The study involved 305 retail investors from whom data were collected and analyzed using the Theory of Planned Behavior and Partial Least Squares Structural Equation Modeling. The results of the study indicated the effects of investors' attitudes, subjective norms, perceived behavioral control as well as attention to market fundamentals on investors' decisions. The findings of the research indicate that valuations of pharmaceutical companies depend upon not only financial fundamentals, but investors' behavior and market sentiment as well.

3.5 Lourdesraj et al. (2021)

In their research on COVID-19 Pandemic impact on the Nifty Pharma Index in India, Lourdesraj, Babu, Gayathri, Indhumathi, and Sathya looked at the volatility of selected pharmaceuticals with reference to daily closing-price data for ten Nifty Pharma companies and made use of descriptive statistics, the Augmented Dickey-Fuller test, and GARCH(1,1) model. The research revealed considerable volatility differences among pharmaceutical companies with, for instance, Divi's Laboratories showing higher volatility than Biocon during the time period. The study shows that analysis should be done on a company basis as averages for a sector may hide significant divergence in risks and market behaviour.

3.6 Varghese et al. (2025)

In their analysis called Fundamental Research and Analysis of India Pharmaceutical Sector, Varghese, Santhosh, Anjana, and Francis examined the investment potential and financial stability of some of the Indian pharmaceutical firms. The researchers used the Altman's Z-score analysis, PESTEL analysis, and Porter's Five Forces Framework in their examination of Cipla, Sun Pharmaceuticals, and Dr. Reddy's Laboratories. They found that Dr. Reddy's Laboratories had the best financial position among the three firms although Cipla and Sun Pharmaceuticals were still financially sound but were in the grey zone according to Altman's Z-score. The authors concluded that it is significant for the pharmaceutical industry to focus on innovation, cost efficiency, and constant monitoring of their financial situation.

3.7 Parab and Reddy (2020)

Parab and Reddy conducted an analysis about a cause and effect relationship between FIIs, DIIs, and stock market returns in India before and after demonetization. In their research, they focused on institutional investment and sectoral stock market returns such as the Nifty Pharma Index. The researchers used correlation, regression, unit root, and diagnostic tests on institutional purchases, sales, and sector returns in the study. The results showed a negative possibility of relationship of short term between institutional trading factors and pharmaceutical sector returns. However, demonetization did not largely change the total institutional flow. Thus, the findings show that the relationship between institutional investment and performance of the pharmaceutical market is complicated and changes depending on the companies and time..

4. RESEARCH GAP

Earlier research has mostly concentrated on pharmaceutical stock performance in terms of returns and volatility, as well as investor activity, innovation, ownership structure, globalisation, and financial strength. There has been little work done that simultaneously compares the impact that the FII/FPI holdings can have on the financial and market performance of a selection of Indian pharmaceutical companies under a common quarterly period.

Research at the sector level is likely to yield an average result that is not very representative of any company. Even with an observed positive relationship at the level of a sector, the individual corporations may show no correlation or even a negative relationship.



This paper aims to fill this gap by creating separate correlation and regression models for the ten selected companies and comparing the direction, strength, explanatory power, and validity of the results obtained in the study.

5. OBJECTIVES OF THE ARTICLE

1. To explore whether Foreign Institutional Investment impacts pharmaceutical companies in different ways: The research investigates the association between FII/FPI holdings and financial performance measures in the case of ten selected companies.
2. To ascertain whether Foreign Institutional Investment affects the accounting and market performance of companies: The article establishes if institutional investment has a greater impact on Revenue, PAT, and EPS or on Share Price and Market Capitalization.
3. To categorize pharmaceutical companies based on their sensitivity to Foreign Institutional Investment: The article categorizes companies into the high-impact, medium-impact and low-impact segment based on the calculated correlation coefficients, beta coefficients, values of R^2 , and statistical significance.
4. To assess how robust and reliable is the company-wise regression analysis: The article assesses regression models based on Durbin-Watson, Shapiro-Wilk, Breusch-Pagan, and Variance Inflation Factor criteria and points out weaknesses affecting the validity of the results.

6. RESEARCH METHODOLOGY

6.1 Research Design

The research methodology chosen for this study is quantitative, as well as descriptive, analytical, and comparative in nature. Descriptive analysis will provide insights into the distribution and movement of the variables, while the company-wise relationships between the holdings of FII/FPI and financial performance will be analyzed through Pearson's correlation and OLS regression modeling techniques.

6.2 Nature and Sources of Data

The research depends exclusively on secondary data gathered from quarterly financial statements, shareholding disclosure reports, stock exchange data, and quarter-end market trends that are covered in the source documents. The analysis period is from FY 2020-21 to FY 2025-26.

6.3 Sample of the Study

The following ten listed Indian pharmaceutical companies were purposively selected:

1. Sun Pharmaceutical Industries Ltd.
2. Dr Reddy's Laboratories Ltd.
3. Cipla Ltd.
4. Divi's Laboratories Ltd.
5. Lupin Ltd.
6. Torrent Pharmaceuticals Ltd.
7. Zydus Lifesciences Ltd.
8. Biocon Ltd.
9. Aurobindo Pharma Ltd.
10. Glenmark Pharmaceuticals Ltd.

Each company contains 24 quarterly observations, resulting in 240 firm-quarter observations.

6.4 Variables of the Study

Type of Variable	Variable	Measurement
Independent variable	FII/FPI holdings	Percentage of equity shares held by foreign institutional or portfolio investors
Accounting dependent variable	Revenue from Operations	Quarterly operating revenue measured in ₹ crore
Accounting dependent variable	Profit after Tax	Quarterly net profit measured in ₹ crore
Accounting dependent variable	Basic EPS	Quarterly earnings per equity share measured in ₹
Market dependent variable	Share Price	Quarter-end closing price per equity share measured in ₹
Market dependent variable	Market Capitalization	Quarter-end market value of equity measured in ₹ crore

6.5 Data Validation

Every company had 24 valid observations for each of the six variables, resulting in a 100% completeness of data. The datasets were assessed for missing values, negative observations, outliers based on the interquartile range, and extraordinary financial items. True impairments, settlements, gains, extraordinary expenses, and adjustments were taken into account because they represented real corporate events instead of erroneous entries.

6.6 Statistical Tools

- Descriptive statistics and trend analysis;
- Pearson's correlation coefficient;
- Ordinary Least Squares regression;
- Coefficient of determination and adjusted coefficient of determination;
- t-test and F-test;
- Durbin-Watson test;
- Shapiro-Wilk normality test;
- Breusch-Pagan heteroscedasticity test;
- Variance Inflation Factor; and
- Comparative responsiveness classification.

Statistical significance was evaluated at the 5 per cent level. A p-value below 0.05 resulted in rejection of the null hypothesis of no significant relationship.

Source: Research methodology adapted from the uploaded Chapter 4 statistical analysis document.

7. MATHEMATICAL AND STATISTICAL MODELS

7.1 Model for Objective 1: Company-Wise Relationship

Pearson's correlation coefficient between FII holdings and performance variable j for company i is calculated as:

$$r_{ij} = \frac{\sum_{t=1}^n (FII_{it} - \overline{FII_i})(Y_{ijt} - \overline{Y_{ij}})}{\sqrt{\sum_{t=1}^n (FII_{it} - \overline{FII_i})^2 \sum_{t=1}^n (Y_{ijt} - \overline{Y_{ij}})^2}}$$

Where FII_{it} is the FII/FPI holding of company i in quarter t, Y_{ijt} is financial-performance variable j, n is 24 quarterly observations and r_{ij} is the company-wise correlation coefficient.

The cross-company heterogeneity of each performance variable is measured as:

$$HI_j = \sqrt{\frac{\sum_{i=1}^K (r_{ij} - \bar{r}_j)^2}{K - 1}}$$

Where HI_j represents the standard deviation of the ten company-wise correlation coefficients. A higher value indicates greater heterogeneity.

7.2 Model for Objective 2: Accounting and Market Effects

The company-wise OLS model is:

$$Y_{ijt} = \beta_{0ij} + \beta_{1ij} FII_{it} + \varepsilon_{ijt}$$

Where β_{0ij} is the intercept, β_{1ij} is the change in performance variable j associated with a one-percentage-point change in FII holdings and ε_{ijt} is the error term.

The slope coefficient is estimated as:

$$\beta_{1ij} = \frac{\sum_{t=1}^n (FII_{it} - \overline{FII_i})(Y_{ijt} - \overline{Y_{ij}})}{\sum_{t=1}^n (FII_{it} - \overline{FII_i})^2}$$

The coefficient of determination is:

$$R_{ij}^2 = 1 - \frac{\sum_{t=1}^n (Y_{ijt} - \hat{Y}_{ijt})^2}{\sum_{t=1}^n (Y_{ijt} - \overline{Y_{ij}})^2}$$

The Accounting Influence Score is:

$$AIS_i = \frac{R_{Revenue,i}^2 + R_{PAT,i}^2 + R_{EPS,i}^2}{3}$$

The Market Influence Score is:

$$MIS_i = \frac{R_{Price,i}^2 + R_{Market\ Cap,i}^2}{2}$$

When MIS_i is greater than AIS_i , FII holdings have a stronger statistical association with market performance. When AIS_i is greater than MIS_i , the association is stronger with accounting performance.

7.3 Model for Objective 3: Responsiveness Classification

The number of statistically significant models is calculated as:

$$N_i = \sum_{j=1}^5 I(p_{ij} < 0.05)$$

Where I is an indicator function taking the value 1 when the regression coefficient is significant and 0 otherwise.

The overall explanatory score is:

$$\overline{R_i^2} = \frac{\sum_{j=1}^5 R_{ij}^2}{5}$$

Statistical Condition	Responsiveness Category
$N_i \geq 4$, or $N_i = 3$ with mean $R^2 \geq 0.40$	High impact
$N_i = 2$, or $N_i = 3$ with mean $R^2 < 0.40$	Moderate impact
$N_i \leq 1$	Low impact

The direction of the effect is separately classified as positive, inverse or mixed according to the signs of the statistically significant beta coefficients.

7.4 Model for Objective 4: Regression Diagnostics

The Durbin-Watson statistic is:

$$DW = \frac{\sum_{t=2}^n (e_t - e_{t-1})^2}{\sum_{t=1}^n e_t^2}$$

A value close to 2 indicates the absence of serial correlation, while values substantially below 2 indicate possible positive autocorrelation.

The Shapiro-Wilk statistic is:

$$W = \frac{(\sum_{t=1}^n a_t e_{(t)})^2}{\sum_{t=1}^n (e_t - \bar{e})^2}$$

A p-value below 0.05 indicates non-normal residuals.

The Breusch-Pagan statistic is:

$$BP = nR_{Auxiliary}^2$$

A p-value below 0.05 indicates heteroscedasticity.

The Variance Inflation Factor is:

$$VIF = \frac{1}{1 - R_{FII}^2}$$

Because each regression contains only one explanatory variable, the VIF equals 1.00 in all models.

8. STATISTICAL ANALYSIS AND INTERPRETATION

8.1 Company-Wise Correlation Analysis

Table 1: Correlation of FII/FPI Holdings with Financial-Performance Indicators

Company	Revenue	PAT	EPS	Share Price	Market Capitalisation
Sun Pharmaceutical	-0.0753	0.0938	0.1542	0.9419***	0.9419***
Dr Reddy's Laboratories	0.9563***	0.4732*	-0.0311	0.9198***	0.9198***
Cipla	0.9044***	0.0744	0.0752	0.9513***	0.9513***
Divi's Laboratories	-0.2623	-0.2687	-0.2682	-0.4363*	-0.4362*
Lupin	0.9708***	0.6972***	0.6977***	0.8443***	0.8443***
Torrent Pharmaceuticals	0.7783***	0.7925***	0.7925***	0.8437***	0.8437***
Zydus Lifesciences	0.0531	0.5453**	0.5458**	0.8248***	0.8248***
Biocon	-0.9208***	-0.7453***	-0.7453***	0.2598	0.2595
Aurobindo Pharma	0.9533***	0.7150***	0.7159***	0.6470***	0.6471***
Glenmark Pharmaceuticals	-0.5913**	-0.3983	-0.3981	-0.3372	-0.3372

Note: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Interpretation: According to the study Lupin had the highest positive correlation between FII and revenue followed by Dr Reddy's and Aurobindo Pharma. Biocon was reported to show very high negative correlations between FII holding and the three accounting variables. The results indicate that seven companies showed positive and significant market relationships. But Divi's Laboratories

shows significant inverse relationships with respect of market. There are large differences in cross-company relationship in terms of directions and strength of correlation.

8.2 Re-Evaluated Cross-Company Heterogeneity

Table 2: Heterogeneity of Company-Wise Correlation Coefficients

Performance Variable	Mean Correlation	Minimum Correlation	Maximum Correlation	Heterogeneity Index
Revenue from Operations	0.2765	-0.9208	0.9708	0.7227
Profit after Tax	0.1983	-0.7453	0.7925	0.5327
Basic EPS	0.1541	-0.7453	0.7925	0.5275
Share Price	0.5458	-0.4363	0.9513	0.5327
Market Capitalisation	0.5458	-0.4362	0.9513	0.5327

Interpretation: The highest Heterogeneity Index, recorded for Revenue, amounts to 0.7227 signifying the effectiveness of the relationship between FII participation and performance of companies. The highest average correlations were recorded for Share Price and Market Value, indicating the better linkage between FII investments and market valuation. Regardless of the average figure, the ranges from negative towards strong positive correlation prove that the effect is not consistent across the examined companies.

8.3 OLS Regression: Accounting Performance

Table 3: Company-Wise Effect of FII/FPI Holdings on Accounting Variables

Company	Revenue: Beta; R ² ; p	PAT: Beta; R ² ; p	EPS: Beta; R ² ; p
Sun Pharmaceutical	-60.91; 0.006; 0.7264	33.15; 0.009; 0.6630	0.2084; 0.024; 0.4718
Dr Reddy's Laboratories	341.46; 0.914; <0.001	49.23; 0.224; 0.0195	-0.2253; 0.001; 0.8852
Cipla	188.22; 0.818; <0.001	6.63; 0.006; 0.7298	0.0829; 0.006; 0.7269
Divi's Laboratories	-41.55; 0.069; 0.2156	-19.00; 0.072; 0.2042	-0.7152; 0.072; 0.2050
Lupin	187.82; 0.942; <0.001	33.36; 0.486; 0.0002	0.7369; 0.487; 0.0002
Torrent Pharmaceuticals	174.74; 0.606; <0.001	46.31; 0.628; <0.001	1.3676; 0.628; <0.001
Zydus Lifesciences	35.18; 0.003; 0.8053	101.98; 0.297; 0.0059	1.0140; 0.298; 0.0058
Biocon	-141.33; 0.848; <0.001	-26.35; 0.555; <0.001	-0.2195; 0.556; <0.001
Aurobindo Pharma	237.99; 0.909; <0.001	34.57; 0.511; 0.0001	0.5912; 0.512; 0.0001
Glenmark Pharmaceuticals	-160.30; 0.350; 0.0023	-19.70; 0.159; 0.0539	-0.6990; 0.158; 0.0540

Interpretation: Lupin and Aurobindo Pharma had significant and positive effects on all accounting metrics including Revenue, PAT, and EPS. Torrent Pharmaceuticals also had positive and significant results on all three accounting variables. Biocon showed statistically significant negative effects on Revenue, PAT and EPS, while Glenmark had negative effects only on Revenue. Sun Pharmaceuticals and Divi's Laboratories reported no significant effects on any accounting measures.

8.4 OLS Regression: Market Performance

Table 4: Company-Wise Effect of FII/FPI Holdings on Market Variables

Company	Share-Price Beta	Share-Price R ²	p-value	Market-Cap Beta (₹ Cr)	Market-Cap R ²	p-value
Sun Pharmaceutical	119.94	0.887	<0.001	28,775.58	0.887	<0.001
Dr Reddy's Laboratories	337.58	0.846	<0.001	5,638.45	0.846	<0.001
Cipla	78.02	0.905	<0.001	6,282.86	0.905	<0.001
Divi's Laboratories	-240.62	0.190	0.0331	-6,387.03	0.190	0.0331
Lupin	117.34	0.713	<0.001	5,327.77	0.713	<0.001
Torrent Pharmaceuticals	186.81	0.712	<0.001	3,157.39	0.712	<0.001
Zydus Lifesciences	146.87	0.680	<0.001	14,988.41	0.680	<0.001
Biocon	2.81	0.067	0.2202	335.66	0.067	0.2208
Aurobindo Pharma	43.71	0.419	0.0006	2,563.08	0.419	0.0006
Glenmark Pharmaceuticals	-72.33	0.114	0.1071	-2,040.19	0.114	0.1071

Interpretation: Statistically significant beneficial market effects were recorded by 7 firms. The highest explanatory power was reported by Cipla whose FII/FPI holdings accounted for 90.50 per cent of the variation in its Share Price and Market Capitalization. Divi's Laboratories was the only firm which showed significant negative market effects. Biocon and Glenmark, did not demonstrate any statistically significant market impacts.

8.5 Comparison of Accounting and Market Effects

Table 5: Accounting Influence Score and Market Influence Score

Company	Accounting Influence Score	Market Influence Score	Stronger Performance Domain
Sun Pharmaceutical	0.013	0.887	Market performance
Dr Reddy's Laboratories	0.380	0.846	Market performance
Cipla	0.277	0.905	Market performance
Divi's Laboratories	0.071	0.190	Market performance
Lupin	0.638	0.713	Market performance
Torrent Pharmaceuticals	0.621	0.712	Market performance
Zydus Lifesciences	0.199	0.680	Market performance
Biocon	0.653	0.067	Accounting performance
Aurobindo Pharma	0.644	0.419	Accounting performance
Glenmark Pharmaceuticals	0.222	0.114	Accounting performance

Interpretation: There was a greater association between the holdings of FII/FPI and the performance of the stock market in the case of seven companies. The difference was especially significant in the case of Sun Pharmaceutical, Cipla and Zydus Lifesciences. The accounting effects were more pronounced in Biocon, Aurobindo Pharma and Glenmark as well. However, Biocon's and Glenmark's accounting effects were mostly negative and Aurobindo Pharma's accounting effect was found to be positive.

8.6 Responsiveness Classification

Table 6: Company-Wise FII Responsiveness

Company	Significant Models out of Five	Overall Mean R ²	Direction and Domain	Impact Category
Sun Pharmaceutical	2	0.363	Positive, market-specific	Moderate impact
Dr Reddy's Laboratories	4	0.566	Broad positive	High impact
Cipla	3	0.528	Positive, market-led	High impact
Divi's Laboratories	2	0.119	Inverse, market-specific	Moderate impact
Lupin	5	0.668	Broad positive	High impact
Torrent Pharmaceuticals	5	0.657	Broad positive	High impact
Zydus Lifesciences	4	0.392	Positive, market-led	High impact
Biocon	3	0.419	Inverse, accounting-specific	High inverse impact
Aurobindo Pharma	5	0.554	Broad positive	High impact
Glenmark Pharmaceuticals	1	0.179	Weak inverse, accounting-specific	Low impact

Interpretation: The most significant positive responsiveness has been shown by Lupin, Torrent and Aurobindo Pharma, as all five of their regression models were statistically significant. Dr Reddy's and Zydus were able to achieve four significant positive models, while Cipla's responsiveness was affected highly by the market. Biocon's responsiveness was statistically significant as well, but it proceeded in the opposite direction and was based on accounting figures. Sun Pharmaceutical and Divi's Laboratories were classified as moderately impactful companies, while Glenmark was low impact.

8.7 Regression Diagnostics and Robustness

Table 7: Summary of Company-Wise Diagnostic Results

Company	Durbin-Watson Range	Normal Models out of Five	Homoscedastic Models out of Five	VIF
Sun Pharmaceutical	0.4145-1.4697	3	4	1.00
Dr Reddy's Laboratories	0.2647-1.1926	3	2	1.00
Cipla	0.9671-1.1933	4	5	1.00
Divi's Laboratories	0.1944-0.5331	3	5	1.00
Lupin	0.2005-1.3259	3	5	1.00
Torrent Pharmaceuticals	0.1841-1.0350	5	2	1.00
Zydus Lifesciences	0.6335-2.4486	3	2	1.00
Biocon	0.2066-2.3640	5	3	1.00
Aurobindo Pharma	0.3368-0.6562	5	2	1.00
Glenmark Pharmaceuticals	0.1495-0.2712	3	0	1.00



Interpretation: In many models, the Durbin-Watson values fell well below 2, suggesting that there may have been positive autocorrelation in the quarterly residuals. Most models for Cipla, Torrent, Biocon, and Aurobindo Pharma appeared to satisfy the normality conditions while some of the models for the other companies showed violations. For Glenmark, the problem of heteroscedasticity was quite pronounced as none of the five models was able to satisfy the Breusch-Pagan homoscedasticity condition. The VIF values were also 1.00 in all models proving that the issue of multicollinearity did not arise. Thus, the models can be interpreted showing the association but not causation. Future research should employ heteroscedasticity-and-autocorrelation-consistent standard errors, autoregressive models, panel data approaches and other control variables.

9. FINDINGS OF THE STUDY

- Considerable FII Impact Variation: The impact of FII was highly dissimilar among the ten selected pharmaceutical firms.
- Maximum Revenue Variation: The revenue generated by the ten companies showed the maximum Heterogeneity index of 0.7227 as the most positive correlation present at Nepali Pharmaceuticals and the most negative at Biocon.
- High Average Market Correlation: FII gave a high average correlation of 0.5458 with the share market capitalization while the average correlation of the same with revenue, PAT and EPS was lower than this value.
- Multiple Positive Impacts: Three companies (Lupin, Torrent Pharmaceuticals and Aurobindo) have positively affected the FII.
- Significant Effects for Dr Reddy's: Dr Reddy's company has reported a strong positive impact on revenue, PAT, share price and market capitalization.
- Market-Dominated Effect on Cipla: In the case of Cipla firm, FII had a strong positive impact only on revenue, share price and market capitalization.
- Special Case of Sun Pharmaceutical: FII shareholding has produced effects on share price and market capitalization for Sun Pharmaceuticals, while there are no effects on revenue, PAT and EPS.
- Cost-Benefit Impacts: The impact of FII on Zydus company on PAT, EPS, share price and market capitalization was positive while the impact on revenue was insignificant.
- Negative Accounting Impacts for Biocon: The effect of FII on the company Biocon was negative as far as revenue, PAT and EPS are concerned and there were no significant market influences.
- Negative Market Effect for Divi's: The effect of FII on the company Divi in terms of share price and market capitalization was significant while the effect on revenue, PAT and EPS remained insignificant.
- Lack of Proper Impact in Glenmark: The company Glenmark showed the significant negative impact on revenue while keeping the relationship with PAT and EPS stagnant.
- Maximum R Square Values: The R² value for Lupin was calculated as 0.942 while the highest R² value for market calculation was reported for the company Cipla that was 0.905.
- Possible Errors: Diagnostic issues like possible autocorrelation, non-normality and heteroscedasticity were found in some models while the errors of multicollinearity were not found.
- No Unique Impact: FII impacts cannot be considered having uniformly positive or negative impact on the performance of the pharmaceutical firms.

10. CONCLUSION

This study reveals that Foreign Institutional Investment has very different effects across the pharmaceutical firms of India. Dr Reddy's Laboratories, Cipla, Lupin, Torrent Pharmaceuticals, Zydus Lifesciences, and Aurobindo Pharma have shown most positive reactions although the relevant financial indicators differ. Sun Pharmaceuticals has shown a positive impact specific to the market, which shows that ownership can have an influence on evaluations without triggering a counterbalancing short-term impact on accounting results. Divi's laboratories record opposite market effects; Biocon experiences opposite accounting effects; while Glenmark's reaction is only moderately negative. The diagnostics have proven that the presence of autocorrelation, non-normality, and heteroscedasticity has meant that the regression coefficients can merely be regarded as correlations but not as confirmation of a causal relationship. Thus, FII/FPI holdings should be viewed as a firm-specific measure whose influence depends on business fundamentals, expectations of investors, state of the market, and certain business characteristics.

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