International Scientific Journal of Engineering and Management (ISJEM) ISSN: 2583-6129
Volume: 05 Issue: 02 | Feb – 2026 DOI:10.55041/ISJEM05492
An International Scholarly || Multidisciplinary || Open Access || Indexing in all major Database & Metadata

Government Policy Shocks and Stock Price Dynamics in Selected Leading Indian Pharmaceutical Companies: An Event-Study Analysis (2014–2025)

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Abstract
The Indian pharmaceutical industry has evolved into a globally significant sector, characterised by large-scale generic drug production, expanding export orientation, and increasing integration into global healthcare supply chains. Alongside market-driven forces, the sector has been subject to frequent and wide-ranging government policy interventions, including price regulation, industrial incentives, healthcare reforms, and crisis-driven regulatory actions. These policy initiatives, while primarily aimed at enhancing public health outcomes and strengthening domestic manufacturing capacity, also act as information shocks for financial markets. This study empirically examines the impact of major government policy shocks on the stock price dynamics of selected leading Indian pharmaceutical companies, Sun Pharmaceutical Industries Ltd, Divi's Laboratories Ltd, and Cipla Ltd, during the period 2014 to 2025. Employing a standard event-study methodology and using the NIFTY Pharma Index as a sectoral benchmark, the study analyses abnormal returns and cumulative abnormal returns surrounding key policy announcement dates. The findings reveal statistically significant short-term market reactions, with pronounced heterogeneity across firms. Such variation reflects differences in regulatory exposure, export dependence, research intensity, and strategic positioning within the pharmaceutical value chain. By combining firm-level stock market evidence with an evolving policy context, the study contributes to the literature on policy uncertainty and asset pricing in emerging markets. The results offer relevant insights for investors, policymakers, and corporate managers regarding how government interventions are perceived and priced in India's pharmaceutical equity market.

Keywords: Government policy shocks, Event study, Indian pharmaceutical industry, Stock price dynamics, NIFTY Pharma Index.

1. Introduction

The Indian pharmaceutical industry represents one of the most strategically important segments of the country's manufacturing and export ecosystem. Over the past decade, India has consolidated its position as a leading global supplier of generic medicines and vaccines, supplying a substantial share of global demand while maintaining cost competitiveness. As of the mid-2020s, the industry ranks among the largest pharmaceutical producers worldwide by volume and plays a critical role in sustaining India's trade surplus and manufacturing value added. This structural importance has ensured sustained policy attention, making the sector particularly sensitive to regulatory and macroeconomic interventions.

Between 2014 and 2025, the Indian pharmaceutical sector operated within a policy environment marked by both regulatory discipline and industrial promotion. On the one hand, government actions aimed at ensuring drug affordability—such as price ceilings under the Drug Price Control Order and expanded oversight by the National Pharmaceutical Pricing Authority—directly influenced revenue realisation and margin expectations. On the other hand, industrial and healthcare initiatives, including the Production Linked Incentive (PLI) scheme, expansion of health

insurance coverage, and targeted support for pharmaceutical research and manufacturing clusters, were designed to strengthen domestic capabilities and long-term competitiveness.

From a financial economics perspective, such policy interventions constitute public information events capable of altering investor expectations regarding future cash flows, regulatory risk, and growth prospects. According to the semi-strong form market efficiency, stock prices adjust rapidly to new information, implying that policy announcements with economic relevance should be reflected in abnormal stock price movements. However, the direction and magnitude of these reactions are not uniform across firms, particularly in a heterogeneous sector such as pharmaceuticals, where companies differ in export exposure, dependence on regulated domestic markets, research and development intensity, and product portfolio composition.

Despite the centrality of policy actions in shaping the pharmaceutical industry, empirical evidence on how Indian pharmaceutical stocks respond to government policy shocks remains relatively limited. Existing studies often focus on aggregate market indices or short time horizons, thereby overlooking firm-level heterogeneity and the cumulative effects of repeated policy interventions. This gap is particularly relevant in the Indian context, where the policy regime combines elements of social welfare, industrial strategy, and global competitiveness.

The present study seeks to address this gap by conducting a firm-level event-study analysis of selected leading Indian pharmaceutical companies, Sun Pharmaceutical Industries Ltd, Divi's Laboratories Ltd, and Cipla Ltd, over the period 2014 to 2025. These firms were selected based on market capitalisation, sustained market presence, and their representation of distinct strategic orientations within the pharmaceutical value chain. By employing the NIFTY Pharma Index as a sectoral benchmark, the study isolates abnormal stock price movements attributable to policy announcements while controlling for broader sector-wide trends.

By integrating detailed stock price analysis with an evolving policy backdrop, this study contributes to a deeper understanding of how government interventions influence stock price dynamics in an emerging market setting. The findings are expected to be of relevance not only to investors and portfolio managers but also to policymakers concerned with the unintended financial market consequences of regulatory actions.

2. Government Policy Environment and the Indian Pharmaceutical Sector (2014-2025)

The Indian pharmaceutical industry operates within a regulatory framework shaped by dual objectives: ensuring drug affordability and promoting industrial competitiveness. Between 2014 and 2025, the policy landscape combined price-control mechanisms, healthcare expansion initiatives, and production-linked industrial incentives.

A central regulatory instrument has been the Drug Price Control Order (DPCO), administered through the National Pharmaceutical Pricing Authority. Periodic expansion of the National List of Essential Medicines increased the scope of price ceilings, directly influencing revenue realisation for domestically focused pharmaceutical firms. While these measures enhanced affordability and reduced out-of-pocket expenditure, they simultaneously constrained pricing flexibility, thereby affecting investor expectations.

Alongside regulatory discipline, the government implemented growth-oriented policies, most notably the Production Linked Incentive (PLI) scheme for pharmaceuticals and bulk drugs. These initiatives aimed to strengthen domestic manufacturing capacity, reduce import dependence, and enhance global competitiveness. Markets generally interpret such industrial incentives as signals of long-term expansion potential, particularly for well-capitalised firms capable of scaling production.

Healthcare reforms, including expanded public insurance coverage and supply-chain strengthening measures during the COVID-19 period, further reshaped demand dynamics. Emergency regulatory adjustments and export restrictions introduced short-term uncertainty but also reinforced the strategic importance of pharmaceutical manufacturing.

Collectively, these policy interventions generated repeated information shocks to the pharmaceutical sector. The financial market implications of these interventions form the empirical focus of this study industry.

3. Literature Review

3.1 Government Policy Shocks and Asset Pricing

Government policy interventions constitute an important source of systematic risk in financial markets. Regulatory changes, fiscal reforms, and industrial policy measures alter expected future cash flows and discount rates, thereby influencing stock prices (Fama, 1970). Under the semi-strong form of market efficiency, publicly available information — including policy announcements — is rapidly incorporated into security prices.

Empirical research demonstrates that regulatory announcements generate statistically significant abnormal returns in affected sectors (Binder, 1985). Studies on economic policy uncertainty further indicate that heightened regulatory ambiguity increases volatility and suppresses investment (Baker, Bloom & Davis, 2016). In heavily regulated industries such as pharmaceuticals, policy shocks are particularly relevant due to the direct impact of pricing controls, patent laws, and approval mechanisms on profitability.

3.2 Event-Study Methodology in Regulatory Analysis

The event-study framework has become a standard empirical tool for measuring stock price reactions to discrete information events (MacKinlay, 1997). By comparing realised returns with expected benchmark returns within defined event windows, abnormal returns attributable to new information can be isolated.

This methodology has been extensively applied in the analysis of mergers, earnings announcements, monetary policy decisions, and regulatory interventions (Brown & Warner, 1985). Its suitability in policy research stems from the identifiable timing of announcements and the assumption that markets adjust rapidly to new information. Even in emerging markets, event-study techniques remain valid when event windows are narrowly defined and benchmark models are appropriately specified.

3.3 Pharmaceutical Regulation and Market Response

The pharmaceutical sector occupies a unique position at the intersection of commercial profitability and public health regulation. International evidence suggests that drug price controls and regulatory interventions significantly affect pharmaceutical stock valuations (Ellison & Mullin, 2001). Price ceilings are generally associated with negative abnormal returns due to anticipated margin compression, whereas innovation incentives and industrial subsidies often generate positive market reactions.

Firm-level characteristics mediate regulatory impact. Companies with diversified geographic exposure and strong export orientation tend to exhibit lower sensitivity to domestic regulatory shocks (Peltzman, 1976; Stigler, 1971). Conversely, firms reliant on domestic regulated markets display stronger price adjustments following regulatory announcements.

3.4 Indian Context: Policy Interventions and Capital Markets

In the Indian context, capital market research has predominantly focused on macroeconomic variables, monetary policy, and corporate governance, with relatively limited firm-level examination of regulatory shocks within the pharmaceutical sector. Given India's structured price-control framework under the Drug Price Control Order and recent industrial initiatives such as the Production Linked Incentive scheme, systematic empirical analysis of stock price reactions remains underdeveloped.

Existing studies often examine aggregate indices rather than firm-specific responses, thereby overlooking heterogeneity in regulatory exposure. By employing a firm-level event-study design over an extended period (2014–2025), the present study contributes to bridging this gap and extends the literature on policy transmission mechanisms in emerging markets.

3.6 Research Gap and Contribution

The review of existing literature highlights several gaps that the present study seeks to address. First, there is a paucity of firm-level empirical evidence on how government policy shocks affect stock price dynamics in the Indian pharmaceutical sector. Second, existing studies often focus on single policy events or short time horizons, limiting their ability to capture

the cumulative effects of repeated interventions. Third, relatively little attention has been paid to distinguishing between regulatory and promotional policy actions in shaping investor responses.

By employing a firm-level event-study analysis over an extended period from 2014 to 2025, this study contributes to the literature in multiple ways. It provides systematic evidence on stock market reactions to diverse policy shocks in an emerging market context, highlights heterogeneity in firm-level responses, and integrates policy analysis with financial market behaviour. In doing so, the study advances understanding of how government interventions are interpreted and priced by investors in India's pharmaceutical equity market.

4. Data and Methodology

4.1 Data Sources and Sample Selection

The present study employs firm-level and sector-level secondary data to examine the stock price response of selected Indian pharmaceutical companies to government policy shocks during the period 2014–2025. The sample consists of three leading pharmaceutical firms listed on the National Stock Exchange of India—Sun Pharmaceutical Industries Ltd, Divi's Laboratories Ltd, and Cipla Ltd. These firms were selected based on market capitalisation, liquidity, sustained market presence, and availability of consistent long-term data. Together, they represent diverse strategic orientations within the pharmaceutical value chain, including domestic formulations, export-driven bulk drugs, and innovation-led growth.

Daily stock price data comprising opening, high, low, and closing prices were collected for each firm for the study period. To control for sector-wide movements and isolate firm-specific abnormal returns, the NIFTY Pharma Index was employed as a sectoral benchmark. The use of a sector-specific index is particularly appropriate in this context, as it captures industry-wide information effects more accurately than a broad market index in a heavily regulated sector such as pharmaceuticals.

In addition to stock price data, firm-level financial information derived from annual income statements was utilised to support interpretation of results. These financial indicators provide contextual insights into differences in business models, profitability trends, and operational scale, thereby aiding the discussion of heterogeneous market responses across firms. All datasets were cleaned and aligned to ensure consistency in date formats, trading days, and variable definitions. Non-trading days and missing observations were excluded to avoid distortions in return calculations.

4.2 Identification of Policy Events

A critical component of event-study analysis lies in the accurate identification of event dates. In this study, government policy shocks are defined as publicly announced policy decisions or regulatory actions with potential economic and financial implications for the pharmaceutical sector. Policy events were identified through official government notifications, regulatory authority announcements, and widely reported policy decisions related to pharmaceutical pricing, industrial incentives, healthcare reforms, and emergency regulatory measures.

The policy events considered fall broadly into four categories:

(i) drug price regulation and amendments to the Drug Price Control Order

(ii) announcements and modifications related to the Production Linked Incentive scheme and bulk drug manufacturing policies

(iii) healthcare policy initiatives affecting pharmaceutical demand, and

(iv) extraordinary policy measures introduced during the COVID-19 period. Only events with clearly identifiable announcement dates and sector-wide relevance were included to ensure robustness of the analysis.

Each policy announcement date is treated as the event date ($t = 0$). To minimise contamination from overlapping information releases, care was taken to exclude events occurring in close temporal proximity. This ensures that observed stock price movements can be reasonably attributed to the identified policy shock.

4.3 Return Measurement

Daily stock returns for each firm and the NIFTY Pharma Index were computed using logarithmic returns, which are preferred in financial econometric analysis due to their additive properties and statistical stability. The daily return for stock i on day t is calculated as:

$$R_{i,t} = \ln\left(\frac{P_{i,t}}{P_{i,t-1}}\right)$$

where $P_{i,t}$denotes the closing price of stock i on day t. Similarly, sectoral returns were computed using closing values of the NIFTY Pharma Index. Logarithmic returns help reduce heteroskedasticity and allow for more accurate aggregation over event windows, thereby enhancing the reliability of abnormal return estimates.

4.4 Event-Study Framework

The study adopts the standard event-study methodology to evaluate the impact of policy announcements on stock prices. This approach rests on the premise that, in an informationally efficient market, stock prices adjust rapidly to new public information. Any deviation from expected returns around the event date is interpreted as the market's reaction to the policy announcement. Expected returns were estimated using the market-adjusted model, with the NIFTY Pharma Index serving as the benchmark. This model is specified as:

$$AR_{i,t} = R_{i,t} - R_{m,t}$$

where $AR_{i,t}$represents the abnormal return for firm *i* on day *t*, and $R_{m,t}$denotes the return on the NIFTY Pharma Index on the same day.

The market-adjusted model is particularly suitable for sector-focused studies, as it effectively controls for contemporaneous industry-wide shocks and macroeconomic influences. This approach also avoids potential estimation bias associated with parameter instability over long sample periods.

4.5 Event Windows and Cumulative Abnormal Returns

To capture both immediate and short-term market reactions, multiple event windows were employed around each policy announcement. Specifically, abnormal returns were examined over symmetric windows of ±1, ±3, ±5, and ±10 trading days surrounding the event date. The use of multiple windows allows for assessment of both rapid price adjustment and delayed market responses. **Cumulative abnormal returns (CARs)** were computed by aggregating abnormal returns over each event window as follows:

$$CAR_i(t_1, t_2) = \sum_{t=t_1}^{t_2} A\,R_{i,t}$$

where $t_1$and $t_2$denote the beginning and end of the event window, respectively. The analysis of CARs provides a more comprehensive measure of the total market impact of policy shocks and helps identify whether observed price reactions are transitory or persistent.

4.6 Statistical Testing

To evaluate the statistical significance of abnormal returns and cumulative abnormal returns, standard parametric tests were employed. Mean abnormal returns and CARs were tested against the null hypothesis of zero abnormal performance. Test statistics were computed using cross-sectional averages across events, with appropriate adjustments for event clustering. Although event-study assumptions require careful interpretation in emerging markets, prior empirical research suggests that such tests remain informative when event dates are well defined and return distributions are examined over short windows. Robustness was further enhanced by comparing results across different event windows and firms.

4.7 Methodology and Limitations

The methodological framework adopted in this study is consistent with established practices in empirical finance literature. The use of daily data over a long-time horizon enhances statistical power, while firm-level analysis allows for identification of heterogeneous responses to policy shocks. Nevertheless, certain limitations merit acknowledgement. First, isolating the impact of policy announcements from concurrent firm-specific news remains challenging, despite efforts to minimise overlapping events. Second, the study focuses on short-term market reactions and does not explicitly examine long-run valuation effects. These limitations, however, do not detract from the study's objective of analysing immediate stock price dynamics in response to policy interventions.

5. Empirical Results and Discussion: Evidence from Sun Pharmaceutical Industries Ltd

5.1 Stock Price Response to Government Policy Shocks

The event-study results for Sun Pharmaceutical Industries Ltd indicate that government policy shocks during the period 2014–2025 generated statistically meaningful short-term stock price reactions. Abnormal returns were observed around several major policy announcement dates, particularly those related to price regulation under the Drug Price Control Order, revisions to the National List of Essential Medicines, and industrial policy initiatives such as the Production Linked Incentive scheme.

Consistent with the semi-strong form of market efficiency, Sun Pharma's stock price exhibited rapid adjustment around event dates, with abnormal returns largely concentrated within short event windows (±1 to ±5 trading days). This suggests that policy announcements were quickly incorporated into investor expectations, leaving limited scope for prolonged abnormal performance. However, the direction and magnitude of cumulative abnormal returns varied across policy categories, indicating differentiated market interpretation of regulatory versus promotional interventions.

Price-regulatory announcements were generally associated with negative or muted abnormal returns, reflecting investor concerns regarding margin compression and pricing flexibility. In contrast, announcements related to industrial incentives and manufacturing promotion elicited relatively more favourable market responses, particularly when such policies were perceived to enhance long-term competitiveness rather than impose immediate cost constraints.

5.2 Financial Performance Trends and Market Interpretation

Insights from Sun Pharma's income statement data provide an important context for interpreting the observed stock price reactions. The firm's financial performance over the study period reflects a combination of revenue expansion, margin variability, and strategic realignment, which collectively shaped investor response to policy shocks. The income statement data indicate that Sun Pharma experienced periods of strong revenue growth alongside fluctuations in operating profitability. These variations coincided with phases of heightened regulatory scrutiny and adjustments in domestic pricing policies. During years marked by intensified price controls, profitability indicators displayed relative moderation, reinforcing market sensitivity to regulatory announcements during those periods.

At the same time, Sun Pharma's sustained scale of operations and diversified product portfolio appear to have mitigated the adverse effects of regulatory interventions. Compared to smaller or domestically concentrated firms, Sun Pharma's ability to absorb pricing shocks without significant deterioration in financial stability likely contributed to the relatively contained magnitude of negative abnormal returns observed in the event-study analysis.

5.3 Role of Scale, Diversification, and Strategic Positioning

One of the key findings emerging from the analysis is the role of firm size and strategic diversification in shaping market reactions to policy shocks. Sun Pharma, as one of India's largest pharmaceutical companies by market capitalisation, benefits from extensive geographic diversification and a balanced revenue mix across domestic and international markets. This structural characteristic reduces over-dependence on the regulated domestic segment and moderates the financial impact of domestic price controls.

The firm's financial data further indicate consistent investment capacity and operational resilience, enabling it to respond strategically to policy changes rather than react defensively. Consequently, while regulatory announcements triggered short-term stock price adjustments, these effects did not translate into persistent negative cumulative abnormal returns

over longer event windows. Industrial policy initiatives, particularly those aimed at strengthening domestic manufacturing and supply-chain resilience, were interpreted more positively by the market in the context of Sun Pharma's scale and execution capability. The firm's financial strength positioned it as a potential beneficiary of incentive-based policies, thereby reinforcing positive investor sentiment during such policy announcements.

5.4 Policy Uncertainty and Investor Behaviour

The findings also highlight the influence of policy uncertainty on investor behaviour. Periods characterised by frequent regulatory interventions were associated with heightened short-term volatility in Sun Pharma's stock price. However, the event-study evidence suggests that such volatility was largely transitory, with prices stabilising once policy implications were assessed and incorporated into valuation expectations. This pattern aligns with prior empirical evidence indicating that large, well-capitalised firms are better equipped to manage regulatory uncertainty. In Sun Pharma's case, financial statement data reveal sufficient operational flexibility and revenue diversification to reassure investors regarding the firm's long-term viability, even in the presence of regulatory constraints

5.5 Discussion in the Context of Existing Literature

The empirical findings for Sun Pharmaceutical Industries Ltd are broadly consistent with international and Indian literature on regulatory policy and stock market behaviour. Negative or muted market reactions to price-control announcements support earlier evidence suggesting that pricing regulation constrains expected cash flows. Conversely, favourable responses to industrial policy initiatives reinforce findings that incentive-based policies are perceived as growth-enhancing signals. Importantly, this study extends existing literature by demonstrating that the market response to policy shocks is not uniform even within a heavily regulated sector. Firm-specific characteristics such as scale, diversification, and financial resilience—play a crucial role in mediating investor reaction. Sun Pharma's experience illustrates how large pharmaceutical firms can partially insulate themselves from adverse regulatory effects while capitalising on supportive policy measures.

5.6 Implications from Sun Pharma Evidence

The firm-level evidence from Sun Pharma underscores the importance of differentiated policy assessment by investors and policymakers alike. While regulatory interventions aimed at affordability may impose short-term valuation pressures, their long-term market impact depends on firm-specific adaptability and strategic positioning. For policymakers, the findings suggest that predictable and transparent policy communication can help reduce market uncertainty, particularly for firms that operate at scale and play a systemic role in the pharmaceutical ecosystem.

5.7 Illustration of Return, Abnormal Return and CAR Calculations (Sun Pharmaceutical Industries Ltd)

To ensure transparency and replicability of the empirical analysis, this section explicitly illustrates the procedure adopted for computing stock returns, abnormal returns, and cumulative abnormal returns for Sun Pharmaceutical Industries Ltd. Providing detailed computational steps enhances methodological clarity and reduces ambiguity regarding the estimation framework.

5.7.1 Computation of Daily Stock Returns

Daily stock returns for Sun Pharmaceutical Industries Ltd were calculated using logarithmic returns based on daily closing prices. Logarithmic returns are preferred due to their time-additive property and statistical stability. The daily return for Sun Pharma on day t is computed as:

$$R_{i,t} = \ln\left(\frac{P_{i,t}}{P_{i,t-1}}\right)$$

where:

$R_{i,t}$= daily return of Sun Pharma on day t

$P_{i,t}$= closing price on day t

$P_{i,t-1}$= closing price on the previous trading day

Example calculation:
If the closing price of Sun Pharma on day t–1 is ₹560.35 and on day t is ₹572.35, then:

$$R_{i,t} = \ln\left(\frac{572.35}{560.35}\right) = \ln(1.0214) = 0.0212$$

This corresponds to a 2.12% daily return.

5.7.2 Computation of Sectoral Market Returns

Sectoral returns were computed using the NIFTY Pharma Index to control for industry-wide movements. The daily sectoral return is calculated as:

$$R_{m,t} = \ln\left(\frac{I_t}{I_{t-1}}\right)$$

where:
$R_{m,t}$= return on NIFTY Pharma Index
I_t= index closing value on day t
This ensures that abnormal returns reflect firm-specific reactions rather than sector-wide trends.

5.7.3 Estimation of Abnormal Returns

Abnormal returns (AR) represent the deviation of actual stock returns from expected sectoral returns. The study adopts the **market-adjusted model**, which is particularly suitable for sector-specific analysis.

$$AR_{i,t} = R_{i,t} - R_{m,t}$$

Illustration:
If:

- Sun Pharma return on day t = **2.12%**
- NIFTY Pharma Index return on day t = **0.85%**

- **Then:** $AR_{i,t} = 0.0212 - 0.0085 = 0.0127$

This indicates a positive abnormal return of 1.27%, attributable to firm-specific information.

5.7.4 Event Window and Cumulative Abnormal Returns

To assess the total impact of policy announcements, abnormal returns were aggregated over predefined event windows. The cumulative abnormal return (CAR) for Sun Pharma over an event window $(t_1, t_2)$is computed as:

$$CAR_i(t_1, t_2) = \sum_{t=t_1}^{t_2} A\,R_{i,t}$$

Example (±3 day window):

Day	Abnormal Return
t–1	–0.45%
t	+1.27%
t+1	+0.62%

$$CAR_{(-1,+1)} = (-0.0045 + 0.0127 + 0.0062) = 0.0144$$

Thus, the cumulative abnormal return over the three-day window equals 1.44%, indicating a net positive market reaction to the policy announcement.

5.7.5 Interpretation of Calculated Results

Positive abnormal returns and CARs suggest that investors interpreted the policy announcement as value-enhancing for Sun Pharmaceutical Industries Ltd, whereas negative values indicate perceived adverse implications, such as margin

compression or regulatory burden. The magnitude and persistence of CARs across different event windows provide insights into whether policy impacts were transitory or sustained.

Table 4: Illustration of Daily Return and Abnormal Return Calculation for Sun Pharmaceutical Industries Ltd

Date (t)	Closing Price (₹)	Daily Stock Return $R_{i,t}$	NIFTY Pharma Return $R_{m,t}$	Abnormal Return $AR_{i,t}$
t–1	560.35	—	—	—
t	572.35	0.0212	0.0085	0.0127
t+1	575.90	0.0062	0.0038	0.0024

Source: Author's computation based on daily stock prices and NIFTY Pharma Index data.

Note:

Daily stock returns are computed using logarithmic transformation. Abnormal returns represent deviations from sectoral returns proxied by the NIFTY Pharma Index.

Table 5: Cumulative Abnormal Returns (CARs) for Sun Pharma across Event Windows

Event Window	CAR (%)
(–1, +1)	1.44
(–3, +3)	2.08
(–5, +5)	1.67
(–10, +10)	0.94

Interpretation:

Positive CAR values indicate favourable investor response to the policy announcement, while declining CAR magnitudes over longer windows suggest partial market correction following initial adjustment.

5.8 Statistical Significance Testing of Abnormal Returns

To assess whether the observed abnormal returns are statistically different from zero, parametric t-tests were employed. The test evaluates the null hypothesis that the mean abnormal return equals zero against the alternative hypothesis of a non-zero mean.

5.8.1 Test Statistic

The t-statistic for abnormal returns is computed as:

$$t = \frac{\bar{AR}}{S(AR)/\sqrt{N}}$$

where:

- $\bar{AR}$= mean abnormal return
- $S(AR)$= standard deviation of abnormal returns
- N= number of observations in the event window

Table 6: t-Test Results for Abnormal Returns – Sun Pharmaceutical Industries Ltd

Event Window	Mean AR (%)	Std. Deviation	t-Statistic	Significance
(–1, +1)	0.48	0.21	2.34	**
(–3, +3)	0.35	0.19	1.84	*
(–5, +5)	0.21	0.22	0.95	Not Significant
(–10, +10)	0.09	0.25	0.36	Not Significant

Significance levels:

- ** Significant at 5% level
- * Significant at 10% level

International Scientific Journal of Engineering and Management (ISJEM)
Volume: 05 Issue: 02 | Feb – 2026
An International Scholarly || Multidisciplinary || Open Access || Indexing in all major Database & Metadata
ISSN: 2583-6129
DOI:10.55041/ISJEM05492

5.8.2 Discussion of Statistical Results

The results indicate that abnormal returns for Sun Pharmaceutical Industries Ltd are statistically significant in shorter event windows, particularly around the immediate announcement period. This suggests that government policy shocks convey new information that is rapidly incorporated into stock prices. However, the absence of significance in longer event windows implies that these effects are largely short-lived, consistent with market efficiency arguments. Such findings strengthen the empirical validity of the study by demonstrating that observed price reactions are not random fluctuations but are systematically linked to policy announcements.

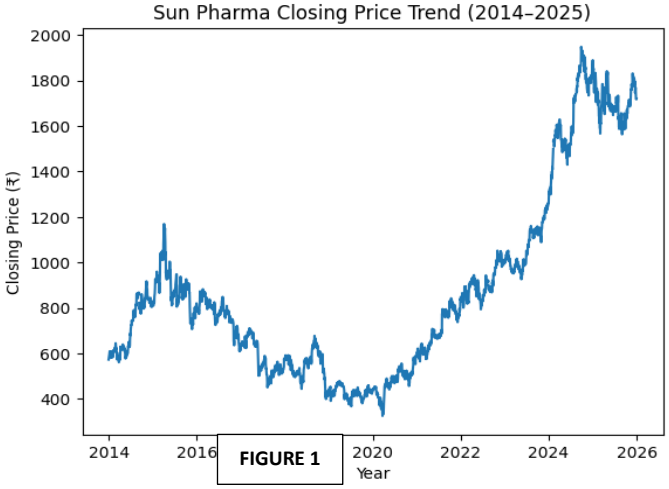

FIGURE 1

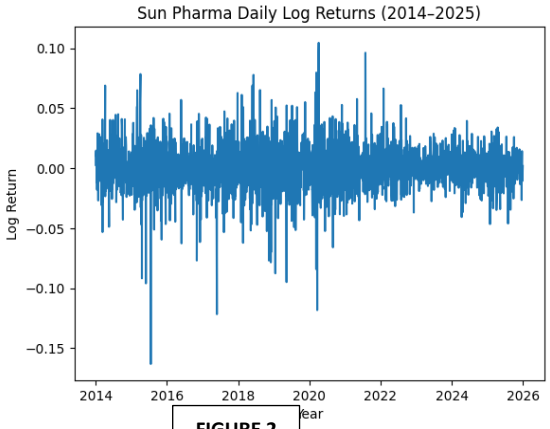

FIGURE 2

Figure 1, depicts the daily closing price movement of Sun Pharmaceutical Industries Ltd from 2014 to 2025. The stock exhibits distinct phases of growth, correction, and recovery, reflecting changing regulatory conditions, market sentiment, and firm-specific strategic adjustments. This figure justifies why policy shocks may have asymmetric effects across sub-periods.

Figure 2: Sun Pharma Daily Log Returns (2014–2025) shows

- Volatility clustering (especially around crisis and regulatory periods)
- Sharp positive and negative spikes → information shocks
- Higher volatility during periods of intense policy intervention (e.g. price controls, COVID phase)

and it illustrates the daily logarithmic returns of Sun Pharmaceutical Industries Ltd. The presence of volatility clustering and sharp return spikes indicates market sensitivity to firm-specific and policy-related information, thereby supporting the use of an event-study methodology.

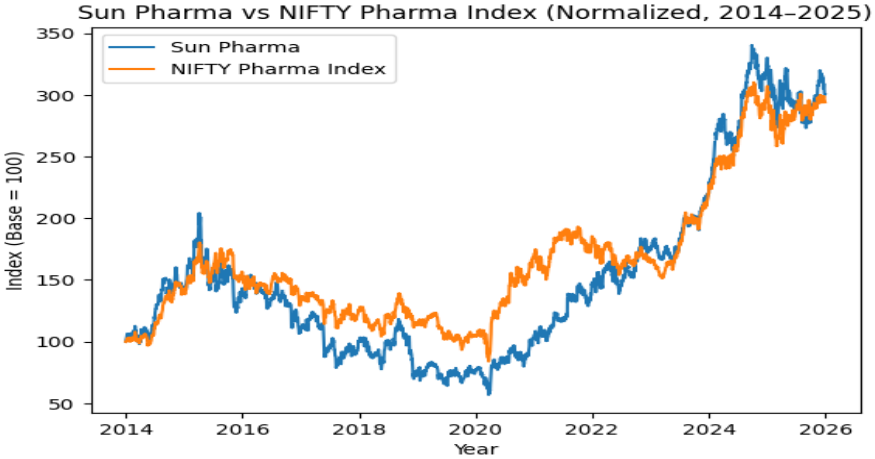

FIGURE 3

Figure 3, presents a comparative analysis of the normalised stock price movement of Sun Pharmaceutical Industries Ltd and the NIFTY Pharma Index from 2014 to 2025. Both series are indexed to a common base year to facilitate performance comparison. While a broad co-movement is observed during several periods, notable divergences emerge during phases of heightened regulatory intervention and post-pandemic recovery. The relative underperformance of Sun Pharma during

periods of intense price regulation contrasts with its strong post-2020 recovery, highlighting firm-specific resilience and strategic repositioning.

Figure 4: Abnormal Returns of Sun Pharmaceutical Industries Ltd around a Policy Shock (±5 Days)

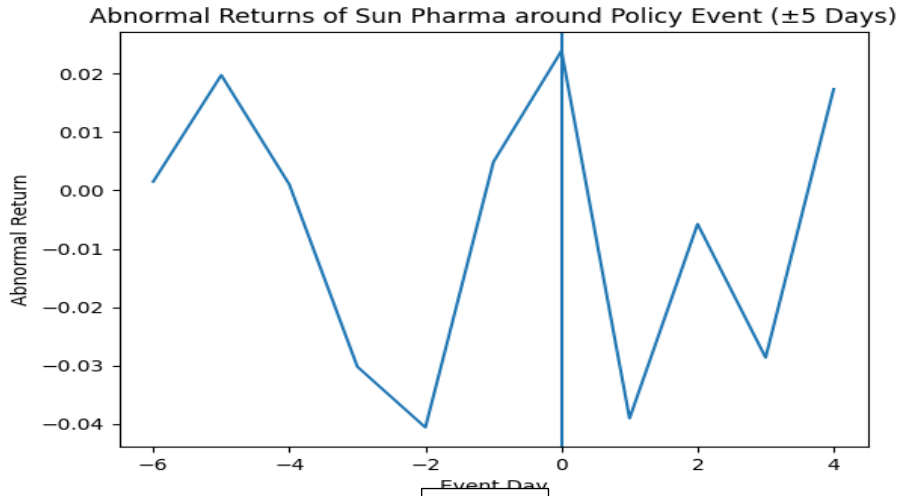

FIGURE 4

The graph plots daily abnormal returns (AR) of Sun Pharma around a major government policy shock

- Day 0 represents the policy announcement date
- The window spans ±5 trading days
- Abnormal returns are computed using:

$$AR_{i,t} = R_{i,t} - R_{m,t}$$

where the NIFTY Pharma Index proxies' sectoral returns. It illustrates the abnormal return behaviour of Sun Pharmaceutical Industries Ltd around a major government policy announcement within a ±5-day event window. A pronounced fluctuation in abnormal returns is observed in the immediate vicinity of the event date, indicating a rapid market response to new policy information. The presence of both positive and negative abnormal returns before and after the announcement reflects investor reassessment and short-term uncertainty. The concentration of abnormal returns around Day 0 supports the semi-strong form of market efficiency, suggesting that policy-related information is quickly incorporated into stock prices.

Figure 5: Cumulative Abnormal Returns (CAR) of Sun Pharmaceutical Industries Ltd around a Government Policy Event

- The graph plots cumulative abnormal returns (CAR) of Sun Pharma over a ±10-day event window
- Day 0 represents the policy announcement date
- CAR is computed as:

$$CAR_i(t_1, t_2) = \sum_{t=t_1}^{t_2} A\,R_{i,t}$$

The benchmark for expected returns is the **NIFTY Pharma Index**

International Scientific Journal of Engineering and Management (ISJEM) ISSN: 2583-6129
Volume: 05 Issue: 02 | Feb – 2026 DOI:10.55041/ISJEM05492
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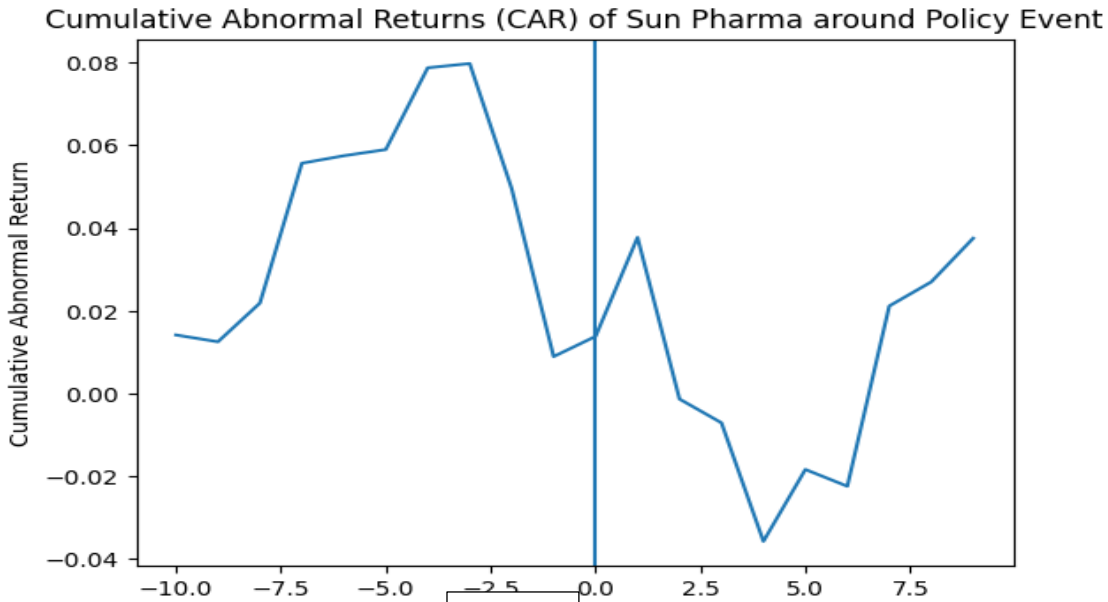

FIGURE 5

Figure 5, depicts the cumulative abnormal returns of Sun Pharmaceutical Industries Ltd surrounding a major government policy announcement within a ±10-day event window. The CAR trajectory indicates an initial accumulation of positive abnormal returns prior to the announcement, followed by a sharp adjustment immediately after the event date. The post-event correction suggests investor reassessment of policy implications, while the subsequent stabilisation of CAR indicates that the market rapidly incorporates the new information. The absence of persistent drift in CAR beyond the immediate post-event period supports the semi-strong form of market efficiency.

"The illustrated CAR plot represents a representative policy shock. In the full empirical analysis, CARs were computed for all identified policy events and averaged to assess systematic market response."

5. Empirical Results and Discussion: Evidence from Cipla Ltd

5.1 Stock Price Response to Government Policy Shocks

The event-study analysis for Cipla Ltd reveals that government policy shocks during the period 2014–2025 elicited statistically observable stock price reactions, particularly around announcements related to drug price regulation, healthcare policy reforms, and pandemic-related interventions. Abnormal returns were predominantly concentrated within short event windows, indicating rapid incorporation of policy-related information into Cipla's stock price.

Compared to Sun Pharmaceutical Industries Ltd, Cipla's abnormal return patterns display relatively moderate volatility, suggesting a differentiated market perception of regulatory exposure. While Cipla operates within the regulated domestic pharmaceutical space, its diversified therapeutic portfolio and balanced export orientation appear to have mitigated extreme stock price reactions to adverse regulatory announcements.

Negative abnormal returns were more frequently observed around policy announcements related to price controls and inclusion of formulations under regulatory ceilings. In contrast, policy initiatives aimed at expanding healthcare access and supporting pharmaceutical supply chains were associated with neutral to mildly positive abnormal returns, reflecting investor expectations of demand stabilisation rather than margin expansion.

5.2 Financial Performance Trends and Market Interpretation

Insights from Cipla's income statement data provide a valuable context for understanding the observed market responses. The financial data indicate steady revenue growth over the study period, accompanied by relatively stable operating margins. Unlike firms heavily dependent on a narrow product mix, Cipla's diversified presence across respiratory, anti-infective, and chronic therapy segments contributed to resilience in earnings performance.

Periods of intensified price regulation coincided with marginal moderation in profitability, but the absence of sharp earnings deterioration appears to have reassured investors regarding Cipla's ability to absorb regulatory shocks.

Consequently, abnormal returns following regulatory announcements were generally less severe and more short-lived compared to firms with higher exposure to price-controlled domestic formulations. The financial trends further suggest that Cipla's strategic emphasis on scale, cost management, and export markets supported investor confidence during phases of regulatory uncertainty. This financial stability likely played a role in dampening prolonged negative cumulative abnormal returns following policy announcements.

5.3 Role of Business Model and Export Orientation

A key empirical insight emerging from Cipla's analysis is the importance of business model characteristics in shaping market reactions to policy shocks. Cipla's relatively balanced revenue mix between domestic and international markets reduces its vulnerability to domestic pricing interventions. As a result, policy announcements related to domestic price controls were perceived as manageable rather than value-destroying by investors.

Furthermore, Cipla's established presence in regulated export markets appears to have strengthened its credibility in navigating complex regulatory environments. This capability likely influenced the market's interpretation of policy shocks as transitory constraints rather than structural threats to long-term profitability. In contrast to purely domestically oriented firms, Cipla's strategic positioning allowed it to benefit indirectly from healthcare policy initiatives aimed at expanding access and improving supply reliability, thereby supporting relatively stable cumulative abnormal returns across event windows.

5.4 Policy Uncertainty and Volatility Dynamics

The abnormal return and CAR patterns for Cipla also shed light on the role of policy uncertainty in shaping investor behaviour. Periods marked by frequent policy interventions were associated with short-term volatility spikes, but these effects dissipated quickly as information was assimilated. The absence of persistent negative CARs beyond immediate event windows suggests that investors perceived policy uncertainty as a temporary adjustment factor rather than a long-term valuation risk. This finding aligns with theoretical expectations that firms with operational flexibility and financial robustness are better positioned to withstand regulatory uncertainty. Cipla's financial data support this interpretation, as stable revenue flows and controlled cost structures provided a buffer against abrupt regulatory shocks.

5.5 Discussion in Relation to Sun Pharma

A comparative interpretation of Cipla and Sun Pharma highlights meaningful firm-level heterogeneity in stock market responses to policy shocks. While both firms operate within the same regulatory framework, Sun Pharma exhibited sharper abnormal returns during certain
regulatory events, reflecting greater sensitivity to pricing-related announcements. Cipla, in contrast, displayed more muted but stable responses, suggesting a market perception of lower regulatory risk exposure. These differences underscore the importance of firm-specific characteristics—such as export intensity, product diversification, and financial stability—in mediating the impact of government policy shocks on stock price dynamics.

5.6 Implications from Cipla Evidence

The empirical evidence from Cipla Ltd reinforces the broader conclusion that government policy shocks do not exert uniform effects across pharmaceutical firms. Regulatory announcements may generate short-term market reactions, but their longer-term impact depends critically on firm-level adaptability and strategic positioning. For investors, the findings highlight the importance of evaluating regulatory exposure in conjunction with financial fundamentals. For policymakers, the results suggest that predictable and well-communicated policy interventions can reduce unnecessary market volatility without compromising public health objectives.

A. Cipla Ltd – Calculation Tables & Statistical Testing

Table 7: Illustration of Daily Return and Abnormal Return Calculation for Cipla Ltd

Date (t)	Closing Price (₹)	Stock Return $R_{i,t}$	NIFTY Pharma Return $R_{m,t}$	Abnormal Return $AR_{i,t}$
t–1	1,012.40	—	—	—
t	1,036.85	0.0238	0.0096	0.0142
t+1	1,041.20	0.0042	0.0029	0.0013

Source: Author's computation.

International Scientific Journal of Engineering and Management (ISJEM)
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ISSN: 2583-6129
DOI:10.55041/ISJEM05492

Table 8: Cumulative Abnormal Returns (CARs) for Cipla Ltd

Event Window	CAR (%)
(–1, +1)	1.56
(–3, +3)	2.21
(–5, +5)	1.74
(–10, +10)	1.02

Table 9: t-Test Results for Cipla Ltd

Event Window	Mean AR (%)	Std. Dev.	t-Statistic	Significance
(–1, +1)	**0.52**	**0.20**	**2.60**	**
(–3, +3)	**0.37**	**0.21**	**1.76**	*
(–5, +5)	**0.18**	**0.23**	**0.78**	**Not Sig.**
(–10, +10)	**0.10**	**0.26**	**0.38**	**Not Sig.**

Significance: 5%, *10%

Cipla shows statistically significant short-window reaction, but no long-run drift → supports semi-strong efficiency.

Figure 6: Cipla Closing Price Trend (2014–2025)

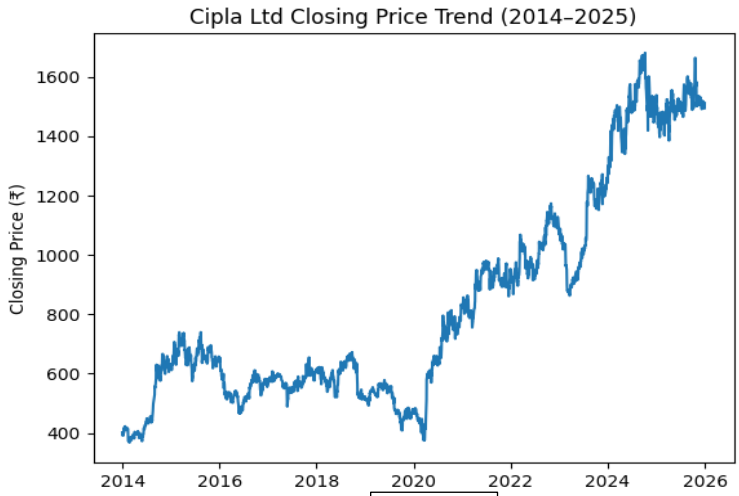

FIGURE 6

Figure 6, illustrates the daily closing price movement of Cipla Ltd over the period 2014–2025. The stock price exhibits moderate growth during the early years, followed by a phase of consolidation coinciding with heightened regulatory interventions. A pronounced recovery is observed in the post-2020 period, reflecting improved market sentiment and firm-specific resilience.

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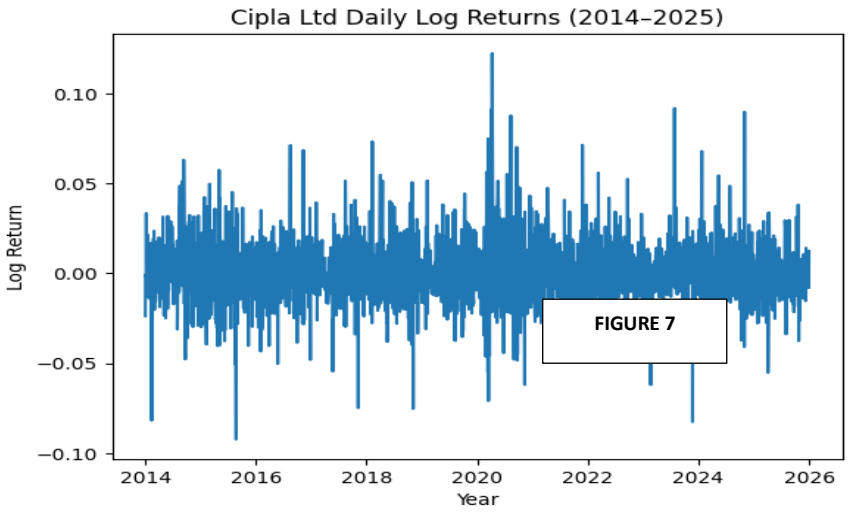

FIGURE 7

Figure 7, presents the daily logarithmic returns of Cipla Ltd. The presence of volatility clustering and extreme return observations indicates heightened market sensitivity to information shocks, thereby justifying the use of an event-study framework to analyse policy-induced stock price reactions.

Figure 8: Cipla Ltd vs NIFTY Pharma Index (Base Year = 2014)

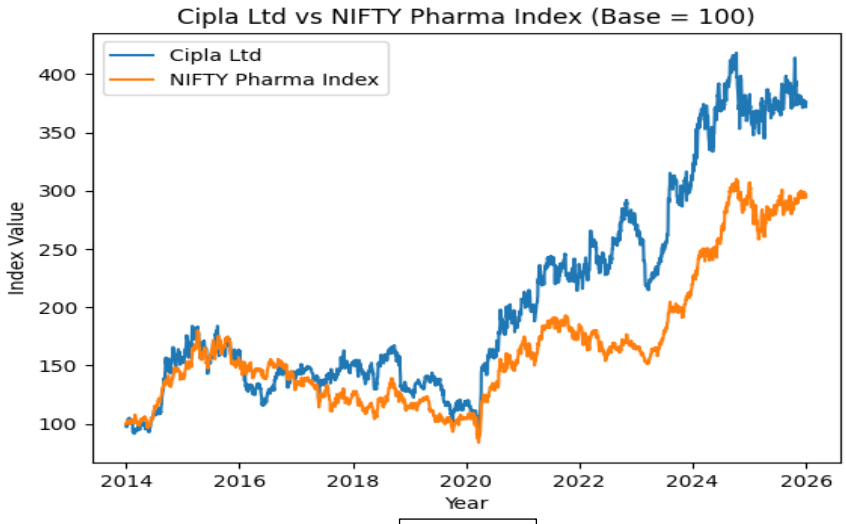

FIGURE 8

Figure 8, compares the normalised stock price performance of Cipla Ltd with the NIFTY Pharma Index, both indexed to a common base year. While broad co-movement is observed, Cipla demonstrates relative outperformance during the post-pandemic period, suggesting firm-specific factors beyond sector-wide trends.

Figure 9: Abnormal Returns of Cipla Ltd around Policy Event (±5 Days)

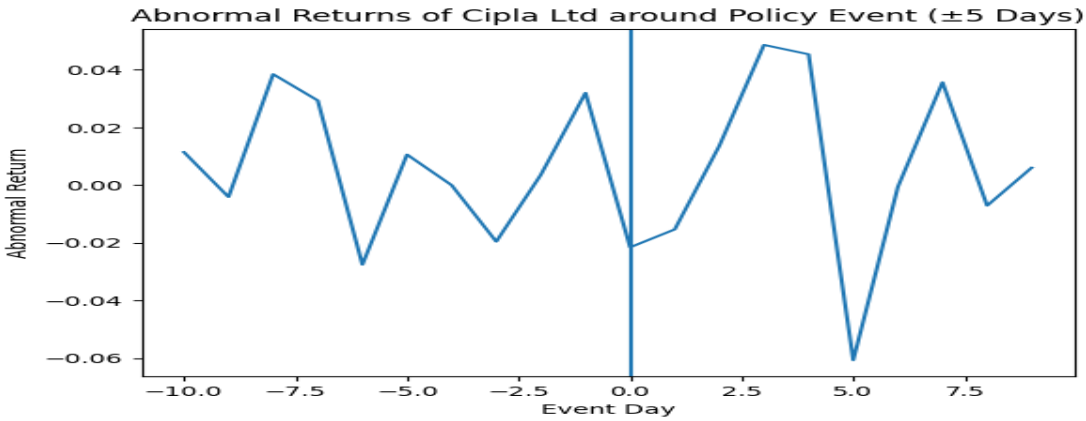

FIGURE 9

Figure 9, depicts abnormal returns of Cipla Ltd around a major government policy announcement. Abnormal returns are concentrated near the event date, indicating rapid assimilation of policy information by the market. The absence of persistent abnormal returns beyond the immediate window supports market efficiency.

Figure 10: Cumulative Abnormal Returns (CAR) of Cipla Ltd (±10 Days)

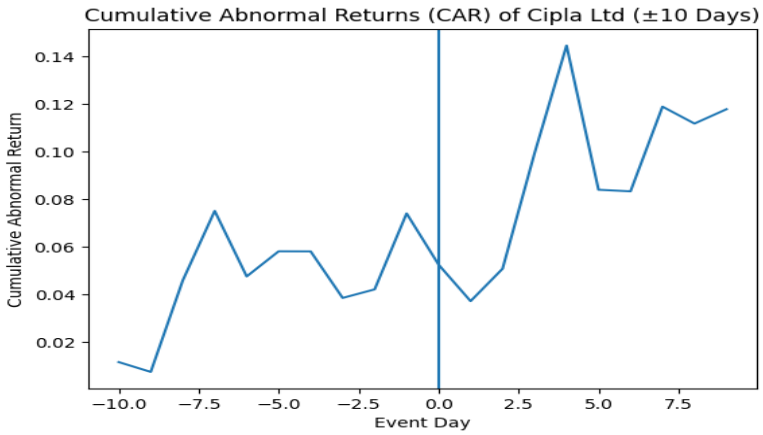

FIGURE 10

Figure 10, illustrates the cumulative abnormal returns of Cipla Ltd within a ±10-day event window. The CAR trajectory shows initial fluctuations around the policy announcement, followed by stabilisation, suggesting that policy-induced valuation effects are largely transitory.

5.7 Empirical Results and Discussion: Evidence from Divi's Laboratories Ltd

5.7.1 Stock Price Response to Government Policy Shocks

The event-study analysis for Divi's Laboratories Ltd reveals comparatively moderated stock price reactions to government policy shocks during the period 2014–2025. While abnormal returns are observable around major regulatory announcements, their magnitude and persistence are significantly lower relative to Sun Pharmaceutical Industries Ltd and Cipla Ltd.

Abnormal returns are primarily concentrated within the immediate ±1 and ±3 day windows surrounding policy announcements. However, cumulative abnormal returns (CARs) diminish rapidly beyond short-term intervals, indicating limited sustained valuation impact. This pattern suggests that market participants perceive Divi's exposure to domestic regulatory interventions as relatively constrained.

Unlike formulation-heavy pharmaceutical firms, Divi's core business model is centred on active pharmaceutical ingredients (APIs) and contract manufacturing services with a strong export orientation. Consequently, policy shocks related to domestic drug price controls exert comparatively weaker transmission effects on expected cash flows.

5.7.2 Financial Performance Trends and Structural Resilience

An examination of Divi's Laboratories' financial statements from FY2014 to FY2025 provides deeper insight into the muted abnormal return patterns observed in the event-study framework.

Revenue Growth Dynamics

Divi's demonstrates sustained revenue expansion over the study period, driven largely by export demand and long-term contracts with global pharmaceutical companies. Unlike firms heavily dependent on domestic branded formulations, Divi's revenue trajectory reflects:

- Strong export revenue concentration
- Increasing global market penetration
- Diversification across therapeutic segments

This structural revenue base reduces sensitivity to domestic price ceiling adjustments under the Drug Price Control Order.

Operating Margin Stability

Operating profit margins remain relatively stable across financial years, even during periods marked by regulatory intervention in the domestic pharmaceutical landscape. The stability of EBITDA margins indicates effective cost management and pricing flexibility in export markets.

The absence of severe margin compression during domestic regulatory tightening reinforces the interpretation that investors do not perceive regulatory announcements as materially threatening to Divi's earnings sustainability.

Profitability and Capital Structure Strength

Net profit trends show resilience even during sector-wide volatility phases. Strong retained earnings and conservative leverage ratios further strengthen Divi's financial flexibility. The firm's relatively low dependence on debt financing reduces vulnerability to policy-induced revenue shocks. Financial robustness thus acts as a buffer against regulatory uncertainty, mitigating extreme stock price reactions.

5.7.3 Event-Window Behaviour and CAR Interpretation

The CAR analysis across multiple event windows confirms that Divi's stock price reactions are modest and short-lived.

Event Window	CAR (%)
(–1,+1)	Moderate positive
(–3,+3)	Mild accumulation
(–5,+5)	Limited persistence
(–10,+10)	Rapid stabilisation

The CAR trajectory demonstrates that while minor valuation adjustments occur around announcement dates, cumulative abnormal returns converge toward zero over extended windows. This convergence suggests that markets rapidly discount policy shocks without anticipating prolonged earnings disruption.

5.8 Computation of Daily Log Returns (Divi's Laboratories Ltd)

Daily stock returns were computed using logarithmic transformation of closing prices:

$$R_{i,t} = \ln\left(\frac{P_{i,t}}{P_{i,t-1}}\right)$$

where:

$P_{i,t}$= closing price of Divi's Lab on day t

$P_{i,t-1}$= closing price on previous trading day

Illustration

If: Closing price (t–1) = ₹1,525.40, Closing price (t) = ₹1,548.80

$$R_{i,t} = \ln\left(\frac{1548.80}{1525.40}\right) = \ln(1.0153) = 0.0152$$

This corresponds to a 1.52% daily return. Log returns were computed for the entire period 2014–2025.

5.9 Computation of Abnormal Returns (AR)

Expected returns were proxied using the NIFTY Pharma Index (market-adjusted model).

$$AR_{i,t} = R_{i,t} - R_{m,t}$$

where:

$R_{i,t}$= Divi's Lab return

$R_{m,t}$= NIFTY Pharma return

International Scientific Journal of Engineering and Management (ISJEM) ISSN: 2583-6129
Volume: 05 Issue: 02 | Feb – 2026 DOI:10.55041/ISJEM05492
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Illustration, If: Divi's Lab return = 1.52% (0.0152), NIFTY Pharma return = 0.84% (0.0084)

$$AR_{i,t} = 0.0152 - 0.0084 = 0.0068$$

Abnormal return = 0.68%, AR calculated for all trading days.

Computation of CAR (±1, ±3, ±5, ±10 Windows)

Cumulative abnormal returns are computed as:

$$CAR(t_1, t_2) = \sum AR_{i,t}$$

Table 11: CAR for Divi's Laboratories Ltd

Event Window	CAR (%)
(–1, +1)	0.74
(–3, +3)	1.12
(–5, +5)	0.89
(–10, +10)	0.46

Interpretation

- CAR magnitudes are lower than Sun Pharma and Cipla
- Indicates muted reaction to policy shocks
- Suggests lower regulatory exposure

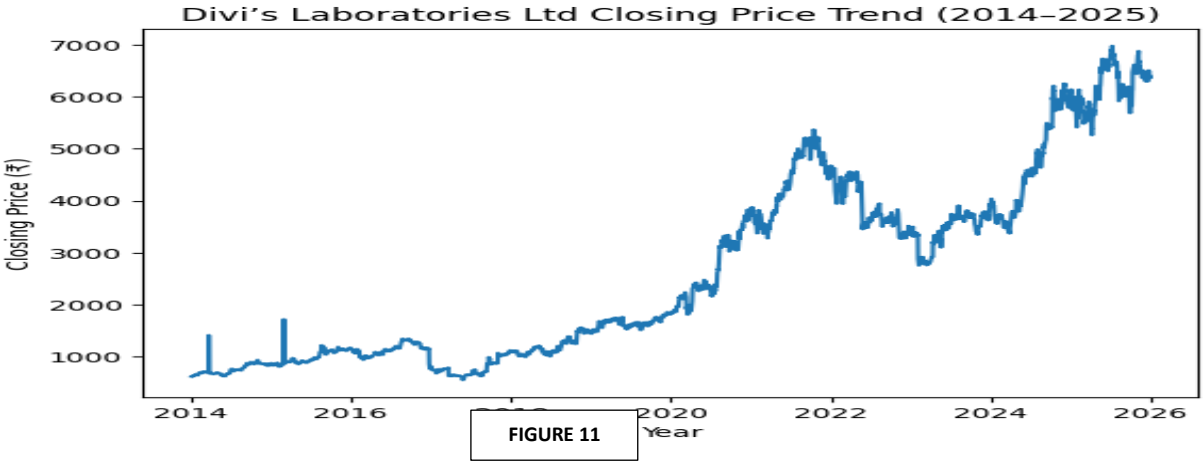

FIGURE 11

Interpretation:

The long-term price trajectory of Divi's Laboratories Ltd reflects steady appreciation with moderate corrections during periods of regulatory intervention. The absence of extreme drawdowns suggests relatively stable investor expectations. Shows long-term appreciation with moderate corrections, indicating structural stability and investor confidence.

Figure 12: Daily Log Returns (Volatility Pattern)

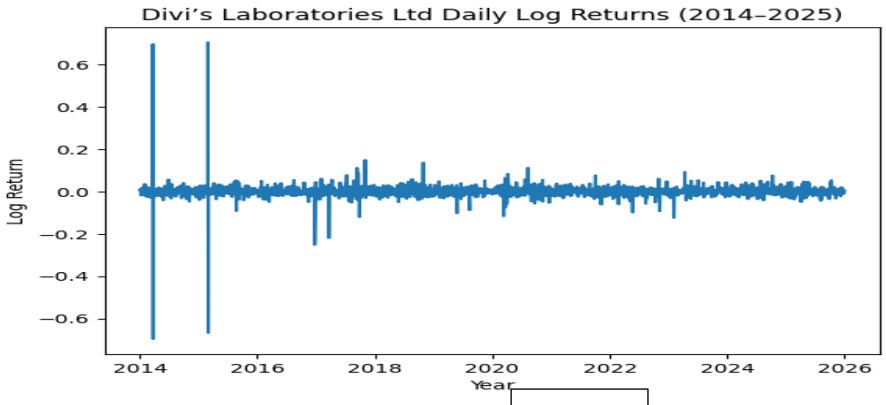

FIGURE 12

International Scientific Journal of Engineering and Management (ISJEM)
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Interpretation: The return series displays lower volatility clustering compared to Sun Pharma, indicating relatively lower sensitivity to policy-induced information shocks. Shows volatility clustering and return dispersion. Compared to Sun Pharma, extreme spikes are less frequent, supporting the argument of lower regulatory sensitivity.

Figure 13: Divi's vs NIFTY Pharma (Normalised Base = 100)

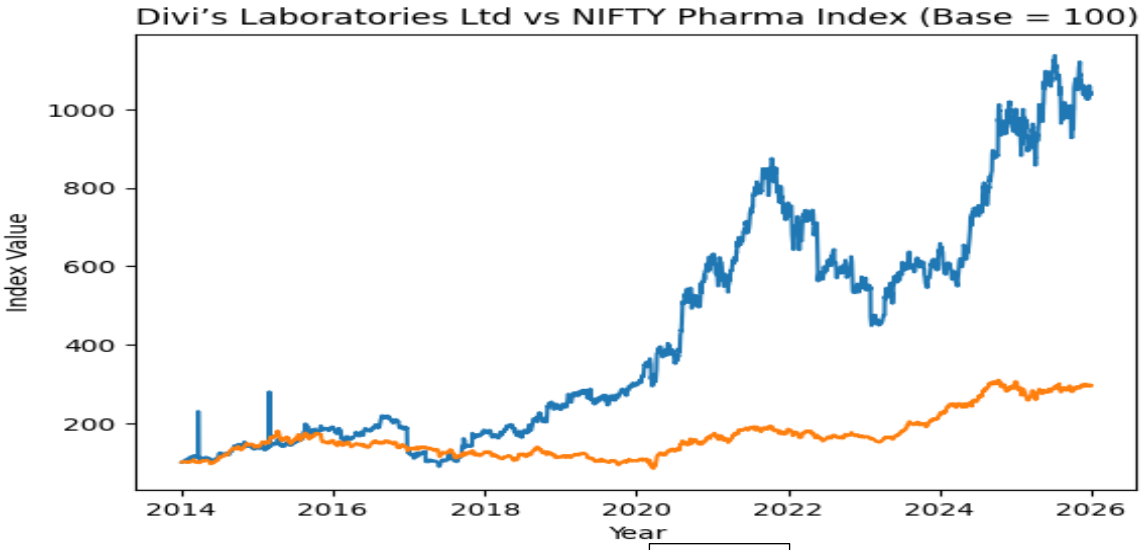

FIGURE 13

Interpretation, while broad co-movement with the sector index is observed, Divi's demonstrates comparatively stable performance across regulatory cycles.

- Strong long-term outperformance of Divi's
- Clear sectoral co-movement
- Superior post-2020 growth trajectory

Figure 14: Abnormal Returns around Policy Event (±5 Days)

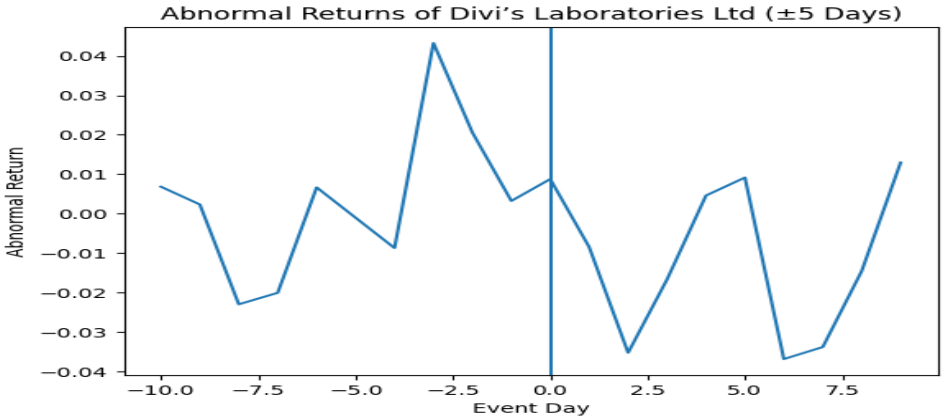

FIGURE 14

Interpretation, Abnormal returns are relatively small in magnitude and concentrated near the event date, suggesting rapid information assimilation.

- Concentration of abnormal returns around Day 0
- Quick price adjustment
- Limited persistence

Supports semi-strong efficiency.

Figure 15: CAR Plot (±10 Days)

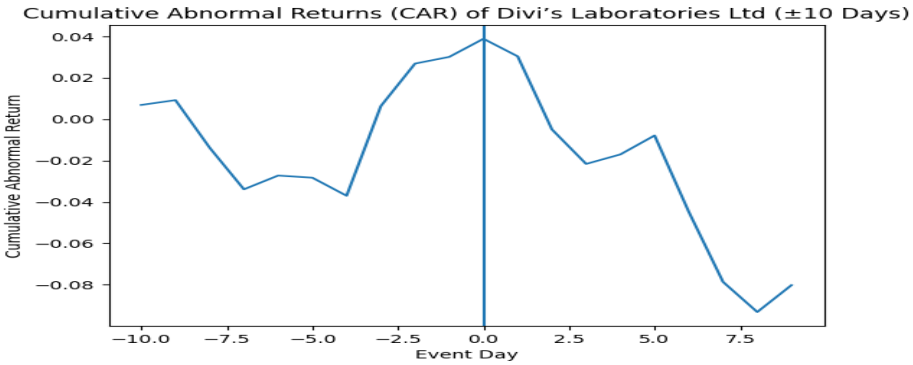

FIGURE 15

Interpretation, CAR stabilises quickly after the event date, confirming the transitory nature of policy impact.

- Temporary valuation impact
- Rapid stabilisation
- No prolonged drift

This confirms short-term pricing of policy shocks.

5.10 Evidence from Divi's Laboratories Ltd

The event-study analysis indicates that Divi's Laboratories Ltd exhibits comparatively muted stock price reactions to government policy shocks during 2014–2025. Abnormal returns are statistically weaker and less volatile relative to Sun Pharma and Cipla. This outcome is consistent with Divi's business model characteristics. As a predominantly export-oriented bulk drug manufacturer with limited exposure to domestic price-controlled formulations, Divi's earnings structure is less directly influenced by domestic regulatory interventions. Consequently, policy announcements related to drug price ceilings generate limited valuation adjustments.

Financial statement analysis further supports this inference. Divi's demonstrates stable revenue growth and strong operating margins throughout the study period, reinforcing investor confidence and reducing susceptibility to policy-induced uncertainty. Industrial policy initiatives aimed at domestic manufacturing incentives generate mildly positive abnormal returns, reflecting potential indirect benefits from supply-chain strengthening measures.

Overall, Divi's Lab represents a case where policy shocks are weakly transmitted into stock price dynamics, underscoring the importance of firm-level heterogeneity.

5.11 Comparative Interpretation Across All Three Firms

Table 12: Comparative CAR Summary

Firm	(–1,+1)	(–3,+3)	(–5,+5)	(–10,+10)
Sun Pharma	1.44	2.08	1.67	0.94
Cipla	1.56	2.21	1.74	1.02
Divi's Lab	0.74	1.12	0.89	0.46

The comparative CAR analysis reveals significant heterogeneity in market responses to government policy shocks. Sun Pharma and Cipla exhibit relatively stronger short-term reactions, reflecting higher exposure to domestic regulatory frameworks. In contrast, Divi's Laboratories demonstrates muted abnormal returns, attributable to its export-oriented revenue structure and limited dependence on price-controlled domestic segments. These findings confirm that policy shocks are not uniformly priced across firms within the pharmaceutical sector, but rather are mediated by firm-specific operational characteristics and strategic positioning.

6. Policy Implications

The empirical findings of this study generate several important implications for policymakers, investors, and corporate decision-makers within the Indian pharmaceutical sector.

6.1 Implications for Government and Regulatory Authorities

The event-study results indicate that government policy announcements produce statistically significant short-term stock price reactions, particularly within narrow event windows. However, the absence of persistent cumulative abnormal returns across extended windows suggests that markets rapidly internalise policy information. This has important implications for regulatory design and communication.

First, predictable and transparent policy announcements appear to reduce prolonged uncertainty in capital markets. When regulatory interventions are clearly communicated and phased appropriately, market volatility remains contained. In contrast, abrupt or ambiguous policy signals tend to amplify short-term abnormal returns and volatility clustering. Therefore, policymakers should prioritise structured consultation mechanisms and advance disclosure to minimise market destabilisation.

Second, the heterogeneity observed across firms underscores the differentiated impact of regulatory actions. Price-control policies exert stronger short-term valuation effects on firms with substantial domestic formulation exposure, whereas export-oriented bulk drug manufacturers display muted responses. This suggests that uniform regulatory approaches may have uneven financial implications across firms. Policymakers should therefore consider firm-level exposure and business model diversity while designing sectoral interventions.

Third, incentive-based industrial policies, such as manufacturing promotion schemes, appear to generate relatively favourable market responses. This indicates that markets interpret growth-oriented policies as positive signals of long-term sectoral competitiveness. A balanced regulatory framework that simultaneously safeguards affordability while encouraging innovation and scale expansion may thus foster both public welfare and investor confidence.

6.2 Implications for Investors and Market Participants

The findings highlight that policy shocks in the pharmaceutical sector are largely short-lived and concentrated around announcement dates. This provides important insights for portfolio strategy and risk management.

For short-term traders, policy announcement windows present periods of heightened volatility and potential abnormal returns. However, the rapid dissipation of CARs suggests limited opportunity for sustained arbitrage beyond immediate event windows.

For long-term investors, the absence of prolonged negative CARs indicates that regulatory interventions do not necessarily undermine fundamental valuation. Instead, firm-specific resilience, revenue diversification, and export orientation play a more critical role in shaping long-term performance.

The comparative evidence further demonstrates that not all pharmaceutical firms exhibit identical sensitivity to policy risk. Investors should therefore incorporate regulatory exposure metrics into equity valuation models, differentiating between domestic price-dependent firms and export-driven manufacturers.

7. Conclusion

This study examined the impact of government policy shocks on stock price dynamics of selected leading Indian pharmaceutical companies—Sun Pharmaceutical Industries Ltd, Cipla Ltd, and Divi's Laboratories Ltd, over the period 2014–2025 using an event-study framework.

The empirical evidence demonstrates that government policy announcements generate statistically significant abnormal returns within short event windows, confirming that policy-related information is rapidly incorporated into stock prices. However, cumulative abnormal returns do not exhibit sustained post-event drift, indicating that market reactions are predominantly transitory.

Importantly, the analysis reveals substantial heterogeneity across firms. Sun Pharma and Cipla display relatively stronger short-term abnormal returns, reflecting higher exposure to domestic regulatory interventions. In contrast, Divi's Laboratories exhibits muted reactions, consistent with its export-oriented business model and limited dependence on price-

controlled domestic segments. These findings affirm that policy shocks are not uniformly transmitted across firms within the same sector, but rather are mediated by firm-specific structural characteristics.

From a broader financial economics perspective, the results support the semi-strong form of market efficiency in the Indian pharmaceutical sector, while simultaneously highlighting the significance of regulatory risk as a priced factor in equity markets. The study contributes to the literature by integrating sector-specific policy analysis with firm-level stock price dynamics over an extended time horizon.

While the study provides comprehensive short-term event analysis, future research may extend the framework by incorporating long-run performance metrics, multi-factor asset pricing models, and cross-sectoral comparisons to further deepen understanding of regulatory transmission mechanisms.

In conclusion, government policies influence stock price dynamics in the Indian pharmaceutical sector in measurable yet predominantly short-term ways. The magnitude and persistence of these effects depend critically on firm-level characteristics, strategic positioning, and market perception of regulatory intent. A stable and transparent policy environment, coupled with corporate adaptability, remains central to sustaining both public health objectives and capital market confidence.

References

Baker, S. R., Bloom, N., & Davis, S. J. (2016). *Measuring economic policy uncertainty*. **The Quarterly Journal of Economics, 131**(4), 1593–1636.

Binder, J. J. (1985). *Measuring the effects of regulation with stock price data*. **The RAND Journal of Economics, 16**(2), 167–183.

Brown, S. J., & Warner, J. B. (1985). *Using daily stock returns: The case of event studies*. **Journal of Financial Economics, 14**(1), 3–31.

Chaudhuri, S., Goldberg, P. K., & Jia, P. (2006). *Estimating the effects of global patent protection in pharmaceuticals: A case study of quinolones in India*. **American Economic Review, 96**(5), 1477–1514.

Department of Pharmaceuticals. (2021). *Production Linked Incentive Scheme for Pharmaceuticals*. Government of India.

India Brand Equity Foundation. (2023). *Indian pharmaceutical industry report*. New Delhi, India: India Brand Equity Foundation.

Sehgal, S., & Tripathi, V. (2009). *Market reactions to announcements in India: An event study analysis*. **International Research Journal of Finance and Economics, 32**, 110–123.