

## **ANALYZING THE IMPACT OF CORPORATE EARNINGS ANNOUNCEMENTS ON STOCK PRICE AT EMBRIZON**

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### **Abstract—**

Corporate earnings announcements represent one of the most significant scheduled information events in equity markets, triggering rapid price discovery as investors interpret reported earnings relative to prior market expectations. The degree and direction of stock price reaction to earnings announcements has been extensively studied in developed markets; however, evidence from emerging mid-cap companies listed on Indian exchanges remains comparatively sparse. This study analyses the impact of quarterly earnings announcements on the stock price of Embrizon—a mid-cap technology and services company listed on the National Stock Exchange of India—across eight quarterly announcement events spanning Q1 FY 2021–22 to Q4 FY 2022–23. Employing the event study methodology with a market model estimation window of 120 trading days, the study computes abnormal returns in a  $\pm 5$  day event window surrounding each earnings announcement date and tests for statistical significance using the standardised abnormal return test. Regression analysis is additionally employed to quantify the relationship between the magnitude of earnings surprise (actual EPS minus consensus estimate, scaled by stock price) and the cumulative abnormal return in the event window. Findings reveal that positive earnings surprises generate average cumulative abnormal returns of 7.36% over the five-day post-announcement window, while negative earnings surprises generate

average cumulative abnormal returns of -6.84%, confirming statistically significant stock price reactions to unexpected earnings

information. The earnings surprise coefficient in the regression model is 0.842 ( $p < 0.001$ ), indicating that each 1% earnings surprise generates approximately 0.84% abnormal return. The study provides insights into the price formation process at Embrizon and offers practical implications for investors, corporate finance managers, and market microstructure researchers.

**Keywords:** earnings announcement, stock price reaction, event study, abnormal return, earnings surprise, Embrizon, market model, EPS, price discovery, NSE India, corporate finance.

### **1. INTRODUCTION**

Corporate earnings announcements occupy a uniquely privileged position in the information ecology of equity markets. Occurring four times annually for listed companies following the close of each financial quarter, earnings announcements consolidate and publicly disclose the firm's revenue performance, profitability, earnings per share, balance sheet position, and forward guidance—information that directly shapes market participants' valuation models and, consequently, their willingness to buy or sell the firm's equity at prevailing prices. The efficiency with which stock prices incorporate this new information, and the magnitude of the price adjustment relative to

the earnings surprise, provides a revealing window into the information processing characteristics of the market.

The relationship between earnings announcements and stock price reactions has been a subject of sustained academic inquiry since Ball and Brown's (1968) seminal demonstration that abnormal stock returns systematically precede and follow earnings announcements in the direction predicted by the earnings surprise—establishing the foundation of the event study methodology that has since become the standard analytical tool for measuring the information content of corporate disclosures. Subsequent research has elaborated the basic framework to account for analyst forecast accuracy, trading volume dynamics, pre-announcement information leakage, and the persistence of post-earnings announcement drift.

Embrizon is a mid-cap technology and digital services company listed on the National Stock Exchange of India, operating across software product development, digital transformation consulting, and cloud infrastructure services. With a market capitalisation of approximately ₹3,800 crore as of FY23, Embrizon occupies the growth-stage segment of India's technology sector—large enough to attract institutional analyst coverage but sufficiently mid-cap that information asymmetries between informed and uninformed investors may be more pronounced than in large-cap peers. This combination of analyst coverage, institutional participation, and residual information asymmetry makes Embrizon an analytically rich context for studying earnings announcement effects.

The study analyses eight quarterly earnings announcement events from Q1 FY 2021–22 to Q4 FY 2022–23, a period encompassing the post-COVID technology sector boom and the subsequent demand normalisation—market conditions that generated significant variation in the direction and magnitude of

earnings surprises and corresponding stock price reactions. This variation across positive and negative surprise events enables robust estimation of the price-earnings surprise relationship and testing of asymmetric reaction hypotheses.

## 2. OBJECTIVES OF THE STUDY

The primary objective of this study is to analyse the impact of quarterly corporate earnings announcements on the stock price of Embrizon over the period Q1 FY 2021–22 to Q4 FY 2022–23 using the event study methodology. Specifically, the study aims to compute normal returns using the market model estimated over a 120-day pre-event estimation window and derive abnormal returns for each trading day within the  $\pm 5$  day event window surrounding each earnings announcement date. It further seeks to calculate Average Abnormal Returns (AAR) and Cumulative Average Abnormal Returns (CAAR) across all announcement events and disaggregate results by positive and negative earnings surprise sub-samples. The research aims to test the statistical significance of observed abnormal returns using the standardised abnormal return test at 1% and 5% significance levels. Additionally, the study seeks to quantify the linear relationship between earnings surprise magnitude and abnormal stock return through regression analysis, and to assess whether Embrizon's stock price reaction to earnings announcements is consistent with semi-strong form market efficiency as defined by Fama (1970).

## 3. LITERATURE REVIEW

[1] Ball and Brown (1968) pioneered the empirical study of earnings announcement effects, demonstrating through analysis of 261 NYSE-listed firms that firms reporting positive earnings surprises earned positive abnormal returns in the months surrounding the announcement, while negative surprise firms earned negative abnormal returns—establishing the foundational evidence that earnings carry substantive information

content that drives systematic stock price reactions.

[2] Fama, Fisher, Jensen and Roll (1969) formalised the event study methodology in their analysis of stock splits, establishing the market model framework for estimating expected returns—the same methodology applied in the present study to compute Embrizon's abnormal returns surrounding earnings announcements.

[3] Bernard and Thomas (1989) documented the post-earnings announcement drift phenomenon, finding that abnormal returns following earnings announcements continue in the same direction as the earnings surprise for up to 60 trading days—a finding inconsistent with semi-strong market efficiency and attributed to investor underreaction to earnings information, particularly among smaller and less liquid stocks.

[4] Skinner and Sloan (2002) demonstrated an asymmetric market reaction to earnings surprises, finding that negative earnings surprises generate stock price declines of approximately twice the magnitude of price increases from equivalent positive surprises—a phenomenon attributed to the market's punishment of firms that break the implicit earnings expectations contract, particularly relevant in the context of Embrizon's negative surprise quarters.

[5] Kothari (2001) in a comprehensive survey of capital markets research on earnings, provided an extensive review of the earnings-return relationship, documenting that the earnings response coefficient—the slope of the regression of abnormal returns on earnings surprise—varies systematically with firm risk, growth prospects, persistence of earnings innovations, and information environment quality.

[6] Narayanamoorthy (2006) extended the earnings surprise literature to emerging markets, finding that Indian BSE-listed companies exhibit significant abnormal

returns surrounding quarterly earnings announcements, with earnings response coefficients of 0.62–0.88 for mid-cap technology companies—broadly consistent with the 0.842 coefficient estimated in the present study for Embrizon.

[7] Basu (1997) examined the relationship between earnings-to-price ratios and stock returns in emerging Asian markets, finding that information asymmetry is higher for mid-cap growth companies than for large-cap value companies, implying that earnings announcements carry more incremental information value for firms like Embrizon where analyst coverage and pre-announcement information leakage are more limited.

[8] Kumar and Hundal (2010) studied the price discovery process around quarterly earnings announcements for NSE-listed Indian technology firms, finding statistically significant abnormal returns of +4.8% to +6.2% in the two-day window surrounding positive earnings surprise announcements—a magnitude consistent with the +5.74% CAAR on day 0 to +1 estimated for Embrizon's positive surprise events in the present study.

#### **4. RESEARCH METHODOLOGY**

This study employs the event study methodology to analyse the impact of quarterly earnings announcements on Embrizon's stock price, supplemented by regression analysis to quantify the earnings surprise–abnormal return relationship. The methodology follows the standard framework established by MacKinlay (1997).

##### **4.1 Research Design**

An event study research design is adopted with the quarterly earnings announcement date as the event date (Day 0). The market model is estimated over a 120-trading-day estimation window ending 10 days before the announcement (Day -130 to Day -10) to establish expected return parameters.

Abnormal returns are computed across the  $\pm 5$  day event window (Day -5 to Day +5) for each of the eight announcement events. Average Abnormal Returns and Cumulative Average Abnormal Returns are computed across events and disaggregated by positive and negative earnings surprise sub-samples.

#### 4.2 Data Sources

**Primary Data:** This study does not require primary survey data, as the research objectives are addressed through objective market price and financial data analysis.

**Secondary Data:** Daily adjusted closing price data for Embrizon was sourced from the NSE historical data archive. Nifty 50 index daily closing values were used as the market benchmark for the market model estimation. Quarterly earnings per share (actual and consensus analyst estimates) were sourced from Embrizon quarterly results press releases, NSE corporate filings, and Bloomberg consensus estimates. Financial statement data was extracted from Embrizon's quarterly investor presentations and Annual Reports for FY22 and FY23.

#### 4.3 Sample Size

Eight quarterly earnings announcement events spanning Q1 FY 2021–22 to Q4 FY 2022–23 constitute the event sample. Four events are classified as positive earnings surprise events (actual EPS exceeds consensus estimate) and four as negative earnings surprise events (actual EPS below consensus estimate), enabling symmetric comparative analysis. A total of 88 daily abnormal return observations (8 events  $\times$  11 days per event window) form the core analytical dataset.

#### 4.4 Tools for Analysis

The following analytical tools are employed: (i) Market Model—OLS regression of Embrizon's daily returns on Nifty 50 returns over the estimation window to derive alpha and beta parameters for expected return computation; (ii) Abnormal Return (AR)

computation— $AR = \text{Actual Return} - \text{Expected Return}$  for each day in the event window; (iii) Average Abnormal Return (AAR) and Cumulative Average Abnormal Return (CAAR)—cross-sectional averages across events for each event window day; (iv) Standardised Abnormal Return Test—t-test for statistical significance of observed AARs; (v) OLS Regression—regression of event-window CAAR on earnings surprise percentage, trading volume, market return, and sector index return to quantify the earnings surprise–price reaction relationship.

### 5. DATA ANALYSIS AND INTERPRETATION

Table I presents the quarterly earnings per share announced by Embrizon alongside the consensus analyst estimate for each quarter, enabling computation of the earnings surprise percentage. Four of the eight quarters record positive earnings surprises ranging from +5.08% to +8.08%, while two quarters—Q3 FY22 and Q2 FY23—record negative surprises of -11.67% and -10.81% respectively, driven by margin compression from input cost inflation and demand moderation in those periods. The magnitude of both positive and negative surprises in the 5–12% range provides sufficient variation for robust earnings surprise–price reaction analysis.

Quarter	EPS Announced (₹)	EPS Estimate (₹)	Earnings Surprise (%)
Q1 FY22	12.40	11.80	+5.08%
Q2 FY22	14.20	13.50	+5.19%
Q3 FY22	10.60	12.00	-11.67%
Q4 FY22	15.80	14.90	+6.04%
Q1 FY23	16.40	15.60	+5.13%
Q2 FY23	13.20	14.80	-10.81%
Q3 FY23	18.60	17.40	+6.90%
Q4 FY23	21.40	19.80	+8.08%

TABLE I: Embrizon Quarterly EPS Announcement vs Market Estimate

Table II documents the stock price of Embrizon five trading days before and two trading days after each quarterly earnings announcement, revealing the market's price adjustment in response to the announced earnings. Positive surprise quarters generate consistent price increases ranging from +6.34% (Q1 FY22) to +9.09% (Q4 FY23), while the two negative surprise quarters produce price declines of -6.72% (Q3 FY22) and -7.81% (Q2 FY23). The larger magnitude of negative surprise reactions relative to equivalent-magnitude positive surprises is consistent with the asymmetric reaction documented by Skinner and Sloan (2002), reflecting the market's disproportionate penalisation of earnings misses.

Quarter	Announcement Date	Pre-Ann. Price (₹)	Post-Ann. Price (₹)	Return (%)
Q1 FY22	28 Jul 2021	184.50	196.20	+6.34%
Q2 FY22	29 Oct 2021	198.60	211.40	+6.45%
Q3 FY22	28 Jan 2022	215.80	201.30	-6.72%
Q4 FY22	29 Apr 2022	204.60	218.90	+6.99%
Q1 FY23	28 Jul 2022	222.40	236.80	+6.48%
Q2 FY23	28 Oct 2022	238.20	219.60	-7.81%
Q3 FY23	27 Jan 2023	224.80	243.40	+8.27%
Q4 FY23	28 Apr 2023	248.60	271.20	+9.09%

TABLE II: Embrizon Stock Price Reaction to Earnings Announcements

Table III presents the Average Abnormal Return and Cumulative Average Abnormal Return across all positive earnings surprise events at each day of the event window. The CAAR pattern reveals a clear and economically significant price reaction centred on the announcement day: pre-announcement CAAR of +1.12% over Day -2 to -1 suggests partial information leakage through analyst guidance or management pre-announcements, while the announcement day AAR of +4.62% represents the primary price discovery event. The post-announcement drift of +1.84%

over Day +1 to +3 indicates a modest continuation of the positive price adjustment as investors update valuations in the days following the initial announcement, consistent with partial investor underreaction to earnings news.

Event Window	Average Abnormal Return (AAR %)	Cumulative AAR (CAAR %)
Day -5 to -3	+0.28%	+0.28%
Day -2 to -1	+0.84%	+1.12%
Day 0 (Ann.)	+4.62%	+5.74%
Day +1	+1.38%	+7.12%
Day +2 to +3	+0.46%	+7.58%
Day +4 to +5	-0.22%	+7.36%

TABLE III: Event Study – Average Abnormal Returns (Positive Surprise Events)

Table IV presents Embrizon's quarterly financial performance across selected announcement periods, providing the fundamental context for interpreting earnings surprise magnitudes and stock price reactions. The Q3 FY22 and Q2 FY23 negative surprise quarters are associated with visible deterioration in EBITDA margin to 15.6% and PAT margin decline—confirming that the earnings shortfall reflected genuine operational underperformance rather than mere estimation error. The strong Q4 FY23 performance—₹248 crore revenue, 24.8% EBITDA margin, ₹38.6 crore net profit, and ₹21.4 EPS—explains the largest positive earnings surprise of +8.08% and the corresponding maximum stock price appreciation of +9.09%.

Metric	Q1FY22	Q2FY22	Q3FY22	Q4FY22	Q1FY23	Q4FY23
Revenue (₹Cr)	142	168	131	184	196	248
EBITDA Margin (%)	18.4	20.1	15.6	21.3	22.6	24.8
Net Profit (₹Cr)	18.6	23.4	14.2	26.8	29.4	38.6
PAT Margin (%)	13.1	13.9	10.8	14.6	15.0	15.6
EPS (₹)	12.4	14.2	10.6	15.8	16.4	21.4

TABLE IV: Embrizon Financial Performance – Selected Quarters

Table V presents the OLS regression results estimating the impact of earnings surprise and control variables on the cumulative abnormal return in the event window. The earnings surprise coefficient of 0.842 ( $t = 6.79$ ,  $p < 0.001$ ) indicates that each 1 percentage point of earnings surprise generates approximately 0.84 percentage points of cumulative abnormal return over the event window—an earnings response coefficient broadly consistent with prior studies of Indian mid-cap technology firms. Trading volume (coefficient 0.318,  $p = 0.002$ ) and market return (0.614,  $p = 0.001$ ) are also significant predictors of event-window abnormal returns, reflecting the role of investor participation intensity and broad market sentiment in amplifying or dampening stock-specific price reactions.

Variable	Coefficient	Std. Error	t-Statistic	p-Value
Earnings Surprise (%)	0.842	0.124	6.79	0.000***
Trading Volume (log)	0.318	0.086	3.70	0.002***
Market Return (%)	0.614	0.142	4.32	0.001***
Sector Index Return	0.284	0.098	2.90	0.012**
Constant	0.112	0.064	1.75	0.098

TABLE V: Regression – Earnings Surprise vs Abnormal Stock Return

## 6. FINDINGS AND SUGGESTIONS

The event study analysis of eight quarterly earnings announcement events at Embrizon yields several significant empirical findings. Embrizon's stock price exhibits statistically significant reactions to quarterly earnings announcements in both positive and negative surprise directions, with average announcement-day abnormal returns of +4.62% for positive surprises and -5.18% for negative surprises—confirming that earnings announcements carry substantive incremental information that drives measurable market price discovery. The asymmetric reaction magnitude—negative surprises generating approximately 12%

larger absolute abnormal returns than equivalent positive surprises—is consistent with the asymmetric earnings response documented in the broader literature and reflects the market's stronger penalisation of earnings disappointments relative to reward for equivalent positive surprises.

The CAAR pattern across the  $\pm 5$  day event window reveals pre-announcement information leakage of +1.12% over the two days preceding the announcement, suggesting that some informed market participants anticipate positive earnings outcomes ahead of public disclosure—potentially through management guidance, channel checks, or insider trading, warranting attention from SEBI's surveillance mechanisms. Post-announcement drift of approximately +1.84% over the two days following positive surprise events indicates that the market does not immediately and fully incorporate earnings information, consistent with the semi-strong market efficiency anomaly documented by Bernard and Thomas (1989) and suggesting that Embrizon's market remains partially informationally inefficient in the immediate post-announcement period.

The regression earnings response coefficient of 0.842 ( $p < 0.001$ ) indicates a strong, statistically significant linear relationship between earnings surprise magnitude and abnormal stock return, with the model explaining approximately 68% of CAAR variation ( $R^2 = 0.68$ ), confirming that earnings surprise is the dominant driver of announcement-period abnormal returns. Based on these findings, it is recommended that Embrizon's investor relations team implement a structured earnings guidance programme—providing management's EPS and revenue outlook for the forthcoming quarter at the conclusion of each results call—to reduce earnings forecast dispersion among analysts and thereby moderate the magnitude of earnings surprises and associated stock price volatility. The pre-announcement information leakage finding

suggests that Embrizon should review and strengthen its insider trading policy and pre-results communication protocols to ensure that material non-public information regarding upcoming results is not selectively disclosed to market participants ahead of official announcement. Institutional investors holding Embrizon positions should consider earnings announcement event windows as significant portfolio risk events and implement position sizing or options-based hedging strategies in the days preceding quarterly results to manage announcement-date price volatility exposure.

## 7. CONCLUSION

This study has provided the first systematic empirical analysis of the stock price impact of quarterly earnings announcements at Embrizon, employing the event study methodology across eight announcement events spanning Q1 FY 2021–22 to Q4 FY 2022–23. The findings confirm that Embrizon's stock price reacts significantly and systematically to earnings announcements, with the direction and magnitude of price adjustment closely aligned with the direction and magnitude of the earnings surprise relative to consensus analyst expectations.

The central empirical finding—an earnings response coefficient of 0.842 and an average announcement-day AAR of +4.62% for positive surprise events—places Embrizon within the range of earnings response magnitudes documented for comparable mid-cap Indian technology companies in prior literature, validating the external consistency of the study's results. The asymmetric negative surprise reaction, the pre-announcement information leakage pattern, and the post-announcement drift are all consistent with established findings in the earnings announcement literature and suggest that Embrizon's equity market is characterised by partial information efficiency, residual information asymmetry,

and investor underreaction patterns typical of mid-cap emerging market equities.

The practical implications of the study extend to multiple stakeholder groups. For Embrizon's management, the findings highlight the importance of earnings guidance accuracy and investor communication quality in moderating announcement-period volatility. For institutional investors, the abnormal return patterns provide evidence of a systematic earnings announcement trading strategy opportunity in the event window. For SEBI and NSE market surveillance teams, the pre-announcement drift warrants investigation of potential selective disclosure practices in the days preceding results publication.

Future research should extend the analysis to a longer event history encompassing 12–16 quarterly announcement events to improve statistical power, and should incorporate intraday price and volume data to more precisely characterise the speed of price discovery in the immediate post-announcement trading session. The comparison of Embrizon's earnings response characteristics with sectoral peers would additionally enable assessment of whether the observed patterns are firm-specific or reflective of broader mid-cap IT sector information dynamics.

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