

Herding and Noise Trading: Unraveling Market Anomalies in The Indian Stock Market

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Abstract: *This study investigates how herding behaviour and noise trading affect anomalies in the Indian stock market, particularly amid rising retail participation through digital platforms. Herding arises when investors mimic the actions of others rather than rely on independent, fundamental analysis, leading to mispricing and market inefficiencies. Noise traders, influenced by speculation, misinformation, and behavioural biases, further amplify irrational market movements. Using behavioural finance theory and empirical data from the BSE and NSE, we applied the Cross-Sectional Absolute Deviation (CSAD) model and rolling-window regressions to detect herding patterns. Additionally, trading volume volatility and return correlations are analysed to assess the presence of noise trading. Our findings reveal that herding is more pronounced during periods of heightened volatility, whereas noise trading appears to play a limited role in persistent market inefficiency. This study underscores the importance of regulatory attention to investor sentiment and proposes interventions to mitigate the systemic risks posed by irrational trading behaviour.*

Keywords: Herding Behavior, Noise Trading, Market Sentiment, Retail Investors, Behavioral Finance, Stock Market Volatility

INTRODUCTION

Research on stock markets usually starts from the position that financial markets display efficiency through stock prices which reflect every piece of available information (Fama, 1970). Market anomalies appear in actual investor practices because psychological biases affect how stock investors behave. Investors tend to mimic other market participants due to herding behaviour, contrary to sound fundamental analysis strategies (Banerjee, 1992). According to Bikhchandani and Sharma (2001), all forms of herding behaviour negatively affect market efficiency by causing unnecessary market volatility, asset mispricing, and generating speculative bubbles. The rising number of retail investors accessing the Indian stock market makes herding behaviour highly significant, as more investors join digital platforms and social media investment trends (SEBI, 2022). Herding behaviour in this market setting becomes visible through its specific characteristics that lead to volatile behaviour and regulatory restrictions alongside speculative market operations. Price movements become irrational when noise trading occurs because investors base their choices on sentiments, misinformation, or speculation instead of fundamental value (Black, 1986). Researchers have conducted multiple empirical tests on herding in worldwide financial markets using samples from both established (Chang, Cheng, & Khorana, 2000) and developing economies (Demirer & Kutan, 2006). Herding behaviour emerges throughout periods of heightened volatility and significant economic events within the Indian market, as established by research studies (Lao & Singh, 2011; Bhowmik & Wang, 2020). Further research is needed to investigate the influence of noise trading on how herding behaviour intensifies in the Indian market context.

The Research investigates behaviour herding among retail investors in the Indian stock market while also exploring its correlation with noise trading dynamics. The study implements Cross-Sectional Absolute Deviation (CSAD) combined with Regression analysis to measure herding behaviour using BSE and Nifty 50 OHLC data, and Volatility statistics using Most Active Equities in NSE to determine noise trading and investor psychology. Knowledge of both herding and noise trading phenomena remains important for policymakers because they endanger market stability and foster systemic risks, along with institutional investors and regulators.

Objectives of the Study

1. To assess the prevalence and magnitude of herding behaviour among retail investors in the Indian stock market using the CSAD methodology.

2. To investigate the correlation between stock returns and volume volatility to discern patterns of noise trading.
3. To evaluate the effects of herding and noise trading on stock price anomalies and overall market volatility.
4. To contrast the association between herding behaviour and noise trading under varying market conditions (e.g. periods of high volatility versus periods of stability).

REVIEW OF LITERATURE

Patwarani and Husodo (2023) conducted an empirical investigation of herding behaviour across six key Asian economies, analysing its impact across COVID and non-COVID periods. Their findings revealed significant herding behaviour in China and Singapore, with stronger herding effects during bearish market conditions in China, Indonesia, and Taiwan. This study highlights the role of the macroeconomic context and market sentiment in influencing collective investor behaviour. In the Indian context, Dutta et al. (2020) explored psychological biases among 500 retail investors using factor analysis. They identified regret, panic, cognitive dissonance, herding, and heuristics as key behavioural drivers of investment decisions. Similarly, Raut et al. (2018), using structural equation modelling (SEM), concluded that individual investors in India often act irrationally, suggesting inefficiencies in the market due to behavioural anomalies.

Contrary to these findings, Satish and Padmasree (2018) found no significant evidence of herding behaviour in India during the global financial crisis. Using the Chang, Cheng, and Khorana (2000) model, their results suggest that Indian investors may be better informed and more aware than previously assumed. This contrast in findings underlines the context-specific nature of herding and the need for more nuanced investigations across different market conditions. In terms of noise trading, Gupta et al. (2022) conducted a bibliometric and content analysis to outline three key themes: the influence of noise traders on market dynamics, their behavioral traits, and the proxies used to measure noise trading effects. Their findings emphasized the relevance of understanding noise trader behavior for rational investors and portfolio managers, as it shapes market efficiency and sentiment. Sinha (2016) extended the classical herding models developed by Banerjee (1992) and Bikhchandani et al. (1992), applying them to high-frequency intraday trading data from the Bombay and National Stock Exchanges. The study introduced a new theoretical perspective on herding, incorporating real-time trading variables such as trade volume, trade price, and timestamp data, offering a microstructural lens into investor behaviour.

Bhowmik and Wang (2020) and Lao and Singh (2011) also explored herding in Asian markets, with a specific focus on volatility linkage and regime-dependent behaviour. They demonstrated that herding is often amplified during high-volatility phases, particularly in emerging markets, where retail investor participation is dominant. Further, Blasco et al. (2012) proposed causality-based models to predict herding intensity using sentiment and returns as key predictors. Their findings confirmed that market sentiment significantly contributes to the emergence and amplification of herding, reinforcing the need to study

behavioural finance through psychological and econometric lenses. Finally, B. et al. (2012) study the market-specific determinants of investor sentiment in the Indian context. Drawing from a sample of 375 investors, this study identifies variables such as information accessibility, risk perception, macroeconomic conditions, and herd behaviour as influential in shaping retail investor sentiment.

METHODOLOGY

This study employs a quantitative approach using secondary data from the Indian stock market (NSE and BSE) to assess herding behaviour and noise trading patterns among retail investors.

Hypotheses

H1: The phenomenon of herding behaviour manifests significantly within the Indian stock market, as evidenced by the application of the CSAD model.

H2: A notable correlation exists between stock returns and volume volatility, indicating the occurrence of noise trading.

H3: The prevalence of herding behaviour is heightened during periods of elevated volatility, resulting in a corresponding increase in noise trading.

Data Sources

i) Stock Data: Daily OHLC prices and trading volume of Nifty 50 and BSE 100 stocks for the past 5 years, sourced from NSE and BSE official databases.

ii) Market Events: Regulatory announcements and market events retrieved from SEBI archives and financial news portals.

Statistical Software

All data analysis was conducted using R statistical software (version 4.x). The following R packages were utilized:

‘quantmod’ and ‘TTR’ for price and return computation
 ‘zoo’ and ‘dplyr’ for data wrangling and rolling statistics
 ‘lm’ for regression modeling
 ‘ggplot2’ for data visualization

Measuring Herding Behavior: CSAD Model

We apply the Cross-Sectional Absolute Deviation (CSAD) model proposed by Chang et al. (2000) to detect herding behavior. The following steps were used:

1. Compute individual stock returns.
2. Calculate the CSAD measure for each trading day.
3. Run the regression:

$$CSAD_t = \alpha + \beta_1 |R_{m,t}| + \beta_2 R_{m,t}^2 + \epsilon_t$$

where $R_{m,t}$ is the market return on day t .

Significance of the squared return coefficient (β_2) was used to infer the presence of herding.

RESULTS

Noise Trading Analysis:

Volume Volatility: Computed as the rolling standard deviation of trading volumes over a fixed window (e.g., 20 days).

Return-Volume Correlation: Daily stock returns

were correlated with volume volatility to identify speculative (noise) trading behavior.

All calculations were performed in R using time-series methods and correlation functions.

Table 1: Non- Linear CSAD Regression Results for detecting Herding behavior

| Variable | Coefficient | Std. Error | t-Statistic | p-Value |
|-------------------------|-------------|------------|-------------|---------|
| Returns Squared | 10.765 | 0.205 | 52.38 | 0 |
| Constant | 0.006 | 0.0001 | 60 | 0 |
| Observations | 1,485 | | | |
| R ² | 0.65 | | | |
| Adjusted R ² | 0.65 | | | |
| F-Statistic | 2,751.00 | | | |
| Residual Std. Error | 0.005 | | | |

This result suggests that investors tend to disperse more when market returns rise or fall sharply, contradicting the presence of herding behaviour.

A high R² value (0.650) implies that the model explains 65% of the variations in CSAD, indicating a strong relationship between market returns and return dispermodelling findings indicate an absence of herding behaviour among investors in the Indian stock market, as return dispersion increases with market movements rather than converging. These results align with the efficient market hypothesis, suggesting that investors respond independently to market information rather than following crowd behaviour.

Table 2: Interpretation of Noise Trading Analysis (using Most Active Equities from Nifty 100)

| Stock | Close | LTP | Daily Returns | Absolute Returns | Volume (Shares) | Volume Volatility |
|--------------|--------|--------|---------------|------------------|-----------------|-------------------|
| Idea | 9.11 | 8.82 | 3.216678 | 0.03288 | 25,84,60,983 | 86.83297 |
| Zomato | 227.25 | 216 | 2.503427 | 0.052083 | 7,12,58,339 | 88.28931 |
| Yes bank | 18.59 | 18.17 | 1.042371 | 0.023115 | 5,55,28,034 | 76.21202 |
| Suzlon | 52.72 | 52.09 | 1.28754 | 0.012094 | 4,94,71,491 | 70.06378 |
| NALCO | 191.05 | 183.83 | 4.675922 | 0.039275 | 4,56,90,365 | 113.8646 |
| GTL Infra | 1.78 | 1.72 | 4.555886 | 0.034884 | 4,02,30,334 | 124.1154 |
| Nykaa | 169.44 | 167.4 | 0.918891 | 0.012186 | 3,47,87,710 | 113.9064 |
| Ola Elec | 67.6 | 65.44 | 1.678312 | 0.033007 | 2,83,76,783 | 114.8803 |
| Swiggy | 362.1 | 335.05 | 3.361403 | 0.080734 | 2,81,85,478 | 120.4775 |
| Ease My Trip | 12.56 | 12.16 | 1.753345 | 0.032895 | 2,81,64,049 | 92.98625 |
| Gold bees | 72.52 | 71.9 | 0.142157 | 0.008623 | 2,68,90,736 | 85.73032 |
| IDFC | 62.91 | 61.7 | 1.45114 | 0.019611 | 2,51,04,579 | 85.0034 |
| JP Power | 14.74 | 14.22 | 2.920554 | 0.036568 | 2,38,44,601 | 82.03094 |
| BEL | 273.45 | 264.45 | 1.076693 | 0.034033 | 2,38,39,025 | 78.43655 |
| Can bank | 93.17 | 90.44 | 0.363712 | 0.030186 | 2,36,95,177 | 62.29409 |
| Tata steel | 134.04 | 130.2 | 0.310013 | 0.029493 | 2,36,35,428 | 73.13578 |
| PNB | 98.31 | 95.13 | 1.00547 | 0.033428 | 2,33,77,744 | 81.76752 |
| Powergrid | 268.7 | 261.3 | 0.684624 | 0.02832 | 2,20,83,955 | 91.33938 |
| Motherson | 135.5 | 128.6 | 1.1954 | 0.053655 | 2,16,55,234 | 44.825 |

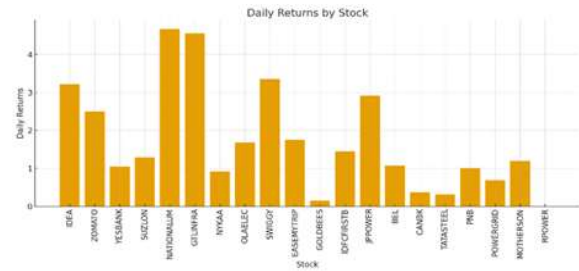


Figure 1: Daily Returns by Stock



Figure 2: Daily Returns over time



Figure 3: Trading volume over time



Figure 4: Volatility trend

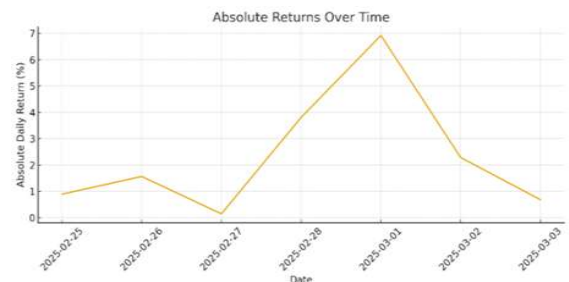


Figure 5: Absolute returns over time

Correlation between Stock Returns and Volume Volatility=
-0.070964604

Average of Absolute Returns= 0.033985135

DISCUSSION

Key Findings from Data

Daily Returns: Stock returns show significant fluctuations, indicating market volatility.

Absolute Returns: These values capture the magnitude of price movement, reinforcing the high volatility in the dataset.

Volume Volatility: The data suggest frequent spikes in trading volume, which may indicate speculative trading.

Correlation between Returns and Volume Volatility: The computed correlation is -0.07096, which is negative but weak.

Interpretation

A strong positive correlation suggests that traders follow price trends, increasing volume as prices change, indicating noise trading.

The correlation value (-0.07096) is slightly negative, implying that volume volatility does not significantly follow return movements.

This suggests that trading volume fluctuations may not be purely speculative or noise-driven, but could involve some informed trading activity.

This low negative correlation suggests that noise trading was not dominant in this dataset.

Retail investors might not react impulsively to price changes, but could be making decisions based on fundamentals.

However, if intraday or extreme movements are considered, short-term speculative trading behaviour might still exist.

CONCLUSION

The examination of herding behaviour and noise trading within the context of the Indian stock market elucidates that herding phenomena are indeed observable, particularly during instances of elevated market volatility; however, noise trading does not emerge as a predominant force. The results of the CSAD regression analysis imply that investors tend to adhere to prevailing market trends under extreme conditions, thereby indicating a proclivity towards sentiment-driven trading practices. Nonetheless, the observed weak negative correlation (-0.07096) between returns and volume volatility, in conjunction with low or erratic turnover ratios, implies that trading activities are not exclusively speculative. Although sporadic surges in turnover may suggest transient speculative behaviour, the overarching market movements appear to be shaped by a confluence of informed trading and sentiment-driven actions, rather than solely by irrational noise trading. This study accentuates the significance of investor sentiment in explaining market anomalies while concurrently asserting that speculative trading does not constitute the primary catalyst for market inefficiencies. Subsequent investigations could delve into intraday trading patterns and event-driven market reactions to further enrich our understanding of these intricate market dynamics.

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