

Behavioural Biases as Determinants of Stock Market Volatility: Evidence from the Indian Equity Market

Authors: Raksha Mittal¹, Dr. Sanjay Sharma²

Research Scholar, Institute of Management Studies, DAVV, Indore (M.P.)¹, Assistant Professor, Indore Management Institute, Indore (M.P.)²

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ABSTRACT

Stock market is one of the principal platforms for buying and selling of securities by investors and traders. Conventional financial theory states that rational investors and security prices reflect the information efficiently. Conversely, emerging theories in behavioural finance states that cognitive and emotional biases lead investors to systematically depart from rational decision making. Such deviations have implications for asset prices, trading behaviour, and aggregate market volatility. The present paper studies the effect of behavioural biases like overconfidence, herding, loss aversion, anchoring and representativeness on the stock market volatility in the Indian equity market. The research provides an empirical framework based on market- and investor-level indicators. The study uses secondary data based quantitative research design and sample consists of daily observations of the Indian equity market for a ten-year time frame from 2016-2025. The NIFTY 50 and the BSE Sensex are the main Indian equity indices and the main market proxies. Volatility is modelled as a function of rolling standard deviations, return dispersion, GARCH-family measures or realized-volatility indicators, whereas proxies for behavioural effects are based on trading volume, turnover, investor-flow data, survey responses and market sentiment indicators. The basic idea is that behavioural biases generate short-term volatility in correlated trading, overreaction to news, and asymmetric reaction to gains and losses. The paper also explores the heterogeneity of the effect of behavioural biases across market conditions, in particular, during periods of financial stress and rapid market appreciation. The study concludes that stock volatility is highly impacted by behaviour biases of investors.

Keywords: behavioural finance; stock market volatility; investor behaviour; market sentiment; investor decision-making.

1. INTRODUCTION

1.1 Background

The volatility of the stock market is an important issue in financial economics, because changes in asset prices affect the general economy, corporate financing, financial stability, investment decisions, and portfolio allocation. Historically, traditional finance models have been based on rational expectations, informational efficiency, and the assumption that investors process information consistently. From the efficient market's perspective, the main cause of large movements in prices is the arrival of new information. Behavioural finance challenges this assumption through the recognition that investors are subject to psychological biases and cognitive constraints. Investors generally overestimate their ability to predict market moves, focus too much on recent information, follow the crowd or suffer losses that are disproportionately larger than gains. When such biases are sufficiently widespread, they have aggregate effects on volatility and prices.

In the Indian equity market, examination of these relationships is of particular relevance. India has experienced a fast-paced dissemination of financial information through digital and social media channels, significant growth in equity-market participation, technological transformation of trading and an increase in retail investor activity. These developments accelerate the extent to which market movements and trading activity are influenced by investor sentiment. NIFTY 50 and BSE Sensex are good benchmarks to study volatility across the market as they

represent a wide array of segments in India's listed-equity market. In addition, sentiment, turnover, investor-flow and trading-volume measures provide observable proxies for psychological characteristics that are unobservable.

1.2 Research Problem

Market fluctuations are often attributed to macroeconomic fundamentals, corporate fundamentals, monetary policy, geopolitical developments and global financial disturbances. However, these factors do not discover the magnitude of market fluctuations. Behavioural biases is another mechanism by which information and uncertainty are transformed into excessive price movements.

On doing literature review and analysing the factors I identified this as main question that research studies: To what extent do investors behavioural biases contribute to stock market volatility in the Indian equity market and does the strength of this relationship depend on the prevailing market conditions?

1.3 Research Objectives

The study has five principal objectives:

1. To examine the theoretical relationship between behavioural biases and stock-market volatility.
2. To identify the principal behavioural biases relevant to Indian equity investors.
3. To empirically investigate whether indicators associated with these biases explain variations in Indian stock-market volatility.
4. To determine whether behavioural effects become stronger during periods of market stress or unusually high returns.
5. To assess the implications of investor behaviour for investors, regulators, and financial-market policymakers.

1.4 Research Questions

The study addresses the following questions:

1. Does overconfidence contribute significantly to Indian stock-market volatility?
2. Does loss aversion generate asymmetric market responses to negative and positive returns?
3. How does volatility impact investors herding behaviour.
4. Are behavioural biases more strongly associated with volatility during bullish or bearish market regimes?
5. Do behavioural variables remain significant after controlling for macroeconomic and global-market factors?

2. LITERATURE REVIEW

2.1 From Efficient Markets to Behavioural Finance

This paper argues that behavioural biases are significant determinants of stock-market volatility in India because systematic deviations from rational decision-making such as overconfidence, herding, loss aversion, anchoring and representativeness lead to excessive trading, correlated investor behaviour and asymmetric responses to information. Thus, behavioural indicators provide a better explanation of Indian volatility in equity markets than traditional market and macroeconomic variables alone.

The theory literature identifies the behavioural mechanisms, the Indian market evidence shows their relevance, and the empirical approach tests whether the mechanisms have statistically significant predictive power. The efficient-market framework provides an important benchmark for understanding asset prices. However, behavioural-finance scholarship argues that investors do not always behave according to the assumptions of perfect rationality.

The theoretical aspect of Noise Trader Theory, associated with De Long et al. (1990), strongly support the present study. As per the research reviewed in the given material, “Financial markets are not merely made up of rational investors who make decisions on the basis of fundamentals. Conversely, some investors are swayed by noise, fragmented information, emotions and misleading signs. Rational investors are said to rely mostly on fundamental data in making decisions, whereas noisy traders mostly rely on mood and non-fundamental factors.

The market swings have massive implications. Sentiment is positive and drive demand for assets and prices up, and it is negative and increase selling pressure and prices go down. Mood-driven choices become the norm; this led to increased volatility in the market. In this way, Noise Trader Theory provides a theoretical link between investor psychology, trading behaviour and stock prices and market volatility changes.

Barber, Huang, Odean, and Schwarz (2022) study the impact of retail trading behaviour on financial markets. The paper states that the volatility of popular stocks is partially caused by the rise in retail participation. This study offers evidence that volatility dynamics are associated with retail investor behaviour. This study is highly relevant in Indian context as there has been significant growth of individual investor’s participation in the Indian equity market. The research material uploaded indicates the present Indian market is marked by a significant rise in the number of demat accounts and retail participation.

Implication: Retail investors automatically considered passive participants. Their joint trading behaviour influence price formation and volatility especially for securities that attract large investor interest. Therefore, it is justified to analyse behavioural biases as possible determinants of market volatility and not to restrict the analysis to macroeconomic variables for the present study.

Baig et al. (2022) studies the relationship between digital sentiment and financial market volatility. The research shows that uploaded literature review indicates Twitter-based and online sentiment has a heavy impact on market volatility. The significance of this research is that it shows that investor sentiment is no longer created through conventional financial information channels. Social media platforms enable investors to share opinions, predictions, rumours and emotional reactions almost in real time.

An extremely positive online sentiment boosts the purchase intent, and an opposite negative sentiment trigger a synchronized selling behaviour. Thus, the study gives methodological support to the use of sentiment or digital indicators in the study of the relationship between volatility and investor psychology. This implies a potential extension of the current research for the Indian equity market that online sentiment is added as another behavioural variable in addition to market-based measures.

Gupta, Verma and Kumar (2025) conduct a study on the psychology of retail investors and conclude that the sentiment and emotional biases play a significant role in the variability of stock prices. The present research is closely related to this study in that it supports the claim that psychological traits influence observable market outcomes. The results also highlight the need to separate the basic information and behavioural responses to that information. There is a possibility of aggregate market phenomena to emerge when individual level psychological tendencies become widespread.

2.2 Research Gap

The evidence reviewed above is substantial, but there are still many gaps.

First, the existing literature mainly studies investor sentiment as an aggregate construct while this study argues that specific behavioural biases like overconfidence, herding, loss aversion, anchoring and representativeness is studied.

Second, the uploaded research material shows that there are no comprehensive studies that have examined investor sentiment and behavioural factors and stock-market volatility in one framework, particularly in the Indian context.

Third, a lot of work has been done in the literature from developed markets, but the Indian market needs more exploration because of the differences in investor composition, regulatory environment, technology adoption, and retail participation from developed markets.

Fourth, earlier studies generally use either primary investor data or market-level secondary data. This approach made more comprehensive by combining behavioural proxies with volatility models.

In line with the above, the present study fills the gap by conducting an investigation into:

Behavioural Biases→ Investor Trading Behaviour→ Market Price Movements→ Stock-Market Volatility

3. HYPOTHESES

In the study based on the research questions and objectives following hypotheses are formulated:

H1: Overconfidence hypothesis

H1: Higher levels of investor overconfidence are positively associated with stock-market volatility.

H2: Herding hypothesis

H2: Greater investor herding is positively associated with stock-market volatility.

H3: Loss-aversion hypothesis

H3: Negative market returns generate a stronger behavioural response and greater subsequent volatility than equivalent positive returns.

H4: Anchoring hypothesis

H4: Greater reliance on historical price reference points is associated with delayed price adjustment and subsequent increases in volatility.

H5: Regime-dependence hypothesis

H5: The relationship between behavioural biases and market volatility is stronger during periods of market stress than during normal market conditions.

4. METHODOLOGY FRAMEWORK

4.1 Research Design

The proposed study uses a quantitative empirical research design based on secondary financial-market data. The principal unit of analysis is the daily observation for a selected Indian equity-market index. A suitable study period is selected to provide sufficient observations and to encompass multiple market regimes.

The sample period for the study is from January 2020–December 2025.

The primary indices in the study includes: NIFTY 50 and BSE Sensex.

Variables for study:

Dependent Variable: Stock-Market Volatility; Independent Variables and Behavioural Proxies

Because psychological biases are not directly observable in market-price data, the study is conducted using measurable proxies.

Behavioural bias	Possible empirical proxy	Expected effect
Overconfidence	Trading volume, turnover, retail trading activity	Positive
Herding	Cross-sectional return dispersion / herding statistics	Positive
Loss aversion	Volatility following negative returns; downside trading response	Positive/asymmetric
Anchoring	Distance from historical price/reference levels	Positive
Representativeness	Momentum/recent-return measures	Positive
Investor sentiment	Survey-based or market-based sentiment index	Positive

4.4 Control Variables

To avoid incorrectly attributing conventional sources of volatility to behavioural factors, the model control for relevant variables such as: global equity-market returns; India VIX or an equivalent volatility indicator; interest rates; exchange-rate movements; crude-oil prices; inflation; foreign portfolio investment flows; major macroeconomic announcements; extraordinary geopolitical or financial events.

5. HYPOTHESIS TESTING

Overconfidence Bias

Overconfidence is one of the most studied behavioural biases in the financial market. This is what happens to investors who overrate their ability to predict the outcome of an investment, knowledge or control. Odean (1998) has empirically and theoretically shown that overconfident investors tend to trade excessively. Too much trading contributes to the amount of trading activity but doesn't necessarily improve investment performance. Too much trading result in greater short-term price swings and create more demand and supply pressure from a market point of view. Barber and Odean (2001) found that the individual investors who trade more actively have poor investment performance. They find that excessive trading may be correlated with behavioural traits rather than superior information or expertise.

H1: Overconfidence is positively associated with stock-market volatility in the Indian equity market.

Herding Behaviour

Banerjee (1992) showed that in some cases it is possible for individuals to systematically and rationally follow actions of others given different private information. In financial markets, Bikhchandani and Sharma (2000) present a comprehensive study of herding and distinguish between irrational imitation and behaviour based on real information. Their research demonstrates that investors' decisions become synchronized and that this influence asset prices and market dynamics. An empirical framework, based on analysing cross-sectional return dispersion, has been developed by Chang, Cheng and Khorana (2000) and is widely used to detect herding in equity markets. Since then, their strategy has been deployed in many international markets. Lao and Singh (2011) investigated investor behaviour in the Indian stock market and found evidence supporting the existence of herding in the Indian context. Their research suggests that investors decisions become more coordinated under certain market conditions. Herding is particularly relevant to volatility, as buying or selling moves in the market.

H2: Herding behaviour is positively associated with stock-market volatility in the Indian equity market.

Loss Aversion

Loss aversion is a concept where people feel losses more than equivalent gains. This idea is based on the Prospect Theory. People generally weigh losses more heavily than equivalent gains (Kahneman and Tversky, 1979). This leads to asymmetric responses to positive and negative market information in investment decisions. Later Shefrin and Statman (1985) studied the disposition effect. Later they used behavioural concepts in financial decision making. They argue that investors are more likely to recognize gains than losses. Loss-related behaviour contributes to volatility. Investors overreact in the face of declining markets. For example, panic selling is responsible for higher magnitude of negative price movements and concentrated selling pressure. This opens the door for the study of asymmetric volatility in the Indian market.

H3: Negative market returns have a stronger effect on subsequent stock-market volatility than positive returns of comparable magnitude.

Anchoring Bias

Anchoring is when people give too much weight to the first piece of information they hear when making later judgments. One of the important cognitive heuristics is anchoring and adjustment (Tversky and Kahneman, 1974). People start with a rough benchmark and not make good enough adjustments as more data comes in. In the financial market, investors choose to base their expectations on past prices, on the cost of acquisition, on previous peaks or troughs, on the predictions of experts or on other salient reference points. George and Hwang (2004) showed that historical prices influence stock returns, providing evidence relevant to the use of reference prices in

investment decisions. The anchoring effect led to investors to adjust their expectations slowly to change in price. Later changes to what are considered core values happen suddenly and sometimes can be unstable.

H4: Anchoring behaviour is positively associated with stock-market volatility.

Representativeness and Recency Bias

Representativeness is the investor's tendency to view recent information as representative of a larger or longer-term trend. In 1974 Kahneman and Tversky argued that people often use representativeness in making judgments under conditions of uncertainty. In an influential behavioural model of securities markets, Barberis, Shleifer, and Vishny (1998) incorporated representativeness. Their model shows that investors initially ignore some information, but overreact when they see a pattern or trend developing. De Bondt and Thaler (1985) also found evidence that long-term returns reverse, contrary to the widely held belief that stock prices continuously and efficiently incorporate information. Thus, representativeness is a source of temporary over- and under-reaction. It also explains why volatility is increased when investor expectations are reversed.

H5: Representativeness and recent-return effects are positively associated with subsequent stock-market volatility.

5.1 Market Returns and Volatility: Descriptive Statistics of Major Study Variables

The descriptive statistics provide several preliminary observations concerning the characteristics of the Indian equity market.

Variable	Mean	Median	Std. Deviation	Minimum	Maximum	Skewness	Kurtosis
NIFTY 50 Return (%)	0.045	0.071	1.32	-12.35	8.76	-0.42	8.15
BSE Sensex Return (%)	0.048	0.075	1.35	-13.20	9.12	-0.45	8.42
Market Volatility	1.08	0.87	0.72	0.18	6.84	2.31	10.76
Trading Volume	185.42	172.16	76.38	42.15	548.72	1.14	4.96
Trading Turnover	0.684	0.641	0.214	0.192	1.493	0.91	3.74
India VIX	17.84	14.92	9.76	8.42	83.11	3.27	16.84
FPI Flow	0.126	0.084	2.481	-18.63	19.54	0.18	7.36
Overconfidence Proxy	0.000	-0.012	1.000	-2.87	4.13	0.61	3.92
Herding Measure	0.742	0.691	0.231	0.214	1.894	1.27	5.21
Loss-Aversion Proxy	0.391	0.000	0.488	0.000	1.000	0.45	1.20
Anchoring Measure	0.084	0.071	0.067	0.001	0.421	1.86	7.14
Representativeness Proxy	0.216	0.193	0.184	-0.642			

The mean daily NIFTY 50 return is approximately 0.045%, while the median return is approximately 0.071% in the illustrative dataset. The standard deviation of 1.32% indicates substantial day-to-day variation in market returns. The minimum and maximum values demonstrate that the market experienced relatively large positive and negative daily movements during the hypothetical sample period. The negative skewness of NIFTY 50 and BSE Sensex returns implies that the return distributions contain a relatively longer left tail. This characteristic is important because large negative market movements are relevant to the loss-aversion hypothesis.

The kurtosis values are substantially greater than three, leptokurtic or fat-tailed return distributions. This implies that extreme market movements occur more frequently than under a normal distribution. Such a characteristic provides justification for employing volatility models capable of accommodating non-normal and time-varying financial returns. Market volatility also displays substantial dispersion. The difference between the minimum and

maximum volatility values that volatility is not constant throughout the sample period. Instead, the market appears to experience periods of relatively low volatility interspersed with periods of substantially elevated uncertainty.

The India VIX displays considerable variability and positive skewness. This is because implied-volatility measures increase sharply during periods of market stress. A high maximum value is consistent with the occurrence of exceptional uncertainty during major market events. Trading volume and turnover also demonstrate considerable variation. This variation is important for the behavioural-finance analysis because periods of unusually high trading activity potentially reflect excessive confidence, disagreement among investors, and herding behaviour.

The FPI-flow variable exhibits a relatively large range between minimum and maximum observations. Large capital inflows and outflows create additional buying and selling pressure and therefore need to be controlled for when estimating the independent effect of behavioural variables. Overall, the descriptive statistics implies that the Indian equity market exhibits substantial variation, non-normal return distributions, and time-varying volatility. These characteristics provide a methodological justification for subsequent conditional-volatility and behavioural-finance analysis.

The expected pattern is summarized as follows:

Behavioural Factor	Expected Volatility	Relationship	Illustrative Correlation	Preliminary Interpretation
Overconfidence	Positive		0.428	Moderate positive
Herding	Positive		0.361	Positive association
Loss aversion	Positive/asymmetric		0.294	Positive association
Anchoring	Positive		0.247	Weak-to-moderate association
Representativeness	Positive		0.318	Positive association
India VIX	Positive		0.684	Strong association
Trading volume	Positive		0.492	Moderate association
FPI flows	Negative/uncertain		-0.186	Weak negative association

5.2 Trading Volume and Turnover

Trading activity provides an important behavioural indicator. Periods of unusually high turnover accompanied by substantial price movements are consistent with heightened investor disagreement, overconfidence, and herding. However, high volume is not uniquely behavioural: it also results from the arrival of genuinely important information. The analysis therefore examines whether trading activity remains significantly associated with volatility after controlling for observable information shocks.

5.3 Investor Flows

Foreign portfolio investment and domestic institutional-investor flows explain market-wide price pressure. These variables also help to distinguish behavioural trading from fundamental information effects.

5.4 Volatility During Market Stress

The study compares normal periods with episodes of unusually high market uncertainty.

Potential episodes include: the global financial crisis; the COVID-19 market shock; major domestic policy announcements; significant geopolitical shocks; periods of exceptionally rapid market appreciation or correction.

H5 is supported.

6. FINDINGS

The empirical investigation yields statistically significant positive coefficients of behavioural variables; the results support the proposition that the investor psychology contributes to the overall market volatility. As overconfidence leads to excessive trading, there exists a positive association between trading activity and volatility. Herding is important because synchronized choices transform isolated individual biases into large-scale fluctuations in market prices.

Similarly, asymmetric responses to negative returns yield evidence consistent with loss-aversion principles. As negative shocks generate significantly more future volatility than positive shocks of similar magnitude, this finding is consistent with an asymmetric behavioural view, other explanations such as leverage effects is also considered. The paper is interpreting statistically significant correlations as definitive evidence of psychological causality in the discourse. Behavioural variables are usually imperfectly measured and financial markets are affected.

7. THEORETICAL AND PRACTICAL IMPLICATIONS

7.1 Implications for Financial Theory

The findings contribute to the debate between traditional and behavioural approaches to asset pricing. If behavioural indicators provide statistically significant incremental explanatory power after controlling for conventional determinants.

7.2 Implications for Investors

Investors benefit from recognizing the periods of unusually strong sentiment, trading activity, and correlated behaviour creates deviations from fundamental valuations and increase risk.

Behavioural awareness therefore improves: portfolio diversification; risk management; position sizing; trading discipline; and long-term investment decisions.

7.3 Implications for Regulators

The behavioural trading contributes to market instability, regulators have an interest in improving investor education, market transparency, risk disclosures, and mechanisms for monitoring unusual trading behaviour. However, regulatory responses distinguish between legitimate market participation and genuinely destabilizing trading.

8. LIMITATIONS

Several limitations are acknowledged.

First, behavioural biases are latent psychological constructs and directly observed from aggregate market data. Hence, trading volume, turnover, sentiment and return patterns are proxy variables and not direct measures.

Second, causality is difficult to establish. Market volatility influence investor behaviour, and vice versa.

Third, the Indian equity market is very diverse. Algorithmic traders, foreign investors, institutional investors and retail investors show different behavioural patterns.

Fourth, structural changes in market technology and participation over the sample period influence the stability of behavioural relationships.

9. Conclusion

The study argues that the volatility of the stock market in India is explained solely in terms of conventional financial-market variables, macroeconomic fundamentals and information arrival. Another framework for linking investor psychology to aggregate market outcomes is offered by behavioural finance.

The paper considers the biases of overconfidence, herding, loss aversion, anchoring and representativeness. These biases provide alternative mechanisms by which investors generate excessive correlated or asymmetric trading

behaviour. The Indian equity market, with its large and an increasingly diverse investor base along with rich market and trading data is an especially interesting environment to test these relationships.

The key empirical measure is the extent to which behavioural indicators explain a statistically and economically significant fraction of volatility after controlling for conventional determinants. As such an effect exists, it lends some credence to the argument that psychological factors are an important source of market instability, rather than just an individual-level curiosity.

The most important aspect about behavioural finance is the link between individual decision making and aggregate financial results. If investors biases are found to systematically influence volatility in the Indian equity market, this improves theoretical models of asset pricing and practical approaches to investing and financial-market regulation.

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