

Analysing Behavioural Bias Effects on Risk Premiums in Retail Derivatives Trading A Decomposition Framework

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ABSTRACT

Behavioural finance has increasingly challenged the assumptions of traditional financial theories by demonstrating that investor decisions are frequently influenced by psychological biases rather than pure rationality. In retail derivatives trading, where leverage, volatility, and speculative decision-making dominate market participation, behavioural biases significantly affect pricing behaviour, risk perception, and premium formation. This study proposes a decomposition framework to analyse the effects of behavioural biases on risk premiums in retail derivatives trading environments. The framework integrates cognitive, emotional, and social biases into a structured analytical model capable of decomposing premium distortions arising from irrational market behaviour. The study investigates how biases such as overconfidence, loss aversion, anchoring, herd mentality, confirmation bias, and disposition effects contribute to deviations in derivatives pricing and risk-adjusted returns. Through a hybrid analytical methodology combining behavioural finance theory, market microstructure analysis, and retail trading behaviour modelling, the research evaluates the interaction between psychological decision processes and premium volatility in derivatives markets. The findings indicate that retail traders often misprice risks due to emotionally driven decisions, excessive speculation, and asymmetric information processing, leading to inflated or compressed risk premiums during volatile market phases. Furthermore, the decomposition framework reveals that behavioural distortions intensify under conditions of high leverage, rapid information dissemination, and social trading influence. The study argues that integrating behavioural decomposition models into derivatives risk analysis enhances the understanding of market inefficiencies and improves predictive assessment of retail-driven premium fluctuations. Overall, the paper demonstrates that behavioural biases are not peripheral anomalies but structural forces that reshape risk pricing dynamics in modern retail derivatives markets..

Keywords: Behavioural Finance, Retail Derivatives Trading, Risk Premiums, Behavioural Biases, Overconfidence, Loss Aversion, Herd Behaviour, Market Psychology, Derivatives Pricing, Decomposition Framework

INTRODUCTION:

The evolution of modern financial markets has transformed retail participation in derivatives trading from a marginal activity into a highly influential force shaping short-term market dynamics, liquidity structures, and speculative pricing behaviour. Technological advancements, zero-commission trading platforms, algorithm-assisted brokerage systems, social trading communities, and real-time financial information networks have significantly lowered barriers to entry for individual investors, encouraging widespread participation in options, futures, and leveraged derivative products. Traditional financial theories such as the

Efficient Market Hypothesis and Rational Expectations Theory assume that market participants process information logically and price assets according to intrinsic risk-return relationships. However, contemporary market behaviour repeatedly demonstrates that retail traders frequently make decisions driven not by rational optimization but by psychological impulses, emotional reactions, cognitive shortcuts, and socially amplified perceptions of opportunity and risk. This divergence between theoretical rationality and observed market behaviour has led behavioural finance scholars to argue that derivatives pricing and risk premiums cannot be fully understood without incorporating investor psychology into analytical frameworks. Retail derivatives

trading environments are particularly vulnerable to behavioural distortions because leverage magnifies both profits and losses, volatility intensifies emotional decision-making, and speculative narratives encourage rapid, often irrational trading activity. In such environments, behavioural biases become deeply embedded within premium formation mechanisms, altering the way risk is perceived, transferred, and priced in financial markets. As a result, risk premiums in derivatives markets often deviate from values predicted by traditional pricing models, reflecting not only fundamental economic variables but also collective behavioural tendencies among retail participants. This study addresses these dynamics by proposing a decomposition framework capable of systematically analysing how behavioural biases influence risk premiums in retail derivatives trading. The framework conceptualizes premium distortions as decomposable outcomes generated through the interaction of cognitive biases, emotional reactions, informational asymmetries, and social influence structures operating within modern speculative markets. By decomposing the behavioural sources of premium fluctuations, the study seeks to provide a deeper understanding of how irrational decision-making contributes to volatility amplification, excessive speculation, and transient market inefficiencies in derivatives ecosystems.

At the same time, the growing dominance of digitally connected retail trading communities has introduced new dimensions to behavioural risk transmission, making psychological market analysis increasingly relevant to derivatives research and financial regulation. Retail traders now operate within highly interactive informational ecosystems shaped by financial influencers, online trading forums, algorithmic recommendation systems, and social media-driven market sentiment. These environments accelerate behavioural contagion, enabling herd behaviour, fear-driven liquidation, speculative momentum chasing, and confirmation bias to spread rapidly across market participants. Derivatives products, due to their leveraged structure and nonlinear payoff characteristics, amplify the consequences of such collective psychological behaviour, causing significant distortions in implied volatility, option premiums, and short-term risk expectations. Overconfidence bias encourages excessive leverage utilization and aggressive premium bidding during bullish sentiment phases, while loss aversion and panic behaviour intensify volatility during market downturns. Similarly, anchoring effects cause traders to rely excessively on recent price levels or historical market narratives when evaluating derivative positions, leading to systematic mispricing of future risk conditions. The interaction of these biases creates unstable pricing environments where market premiums fluctuate not solely because of changes in underlying fundamentals but because of evolving psychological states among retail participants. Existing derivatives pricing models primarily focus on mathematical volatility structures, stochastic processes, and macroeconomic indicators, often overlooking the behavioural mechanisms that influence real-world trading decisions. This gap becomes particularly significant in highly speculative retail-driven markets where emotional and social forces can dominate

short-term price discovery processes. Therefore, this study develops a behavioural decomposition framework that integrates behavioural finance principles with derivatives risk analysis to identify, categorize, and interpret the specific channels through which psychological biases reshape premium structures. By situating retail trading behaviour within broader frameworks of cognitive psychology, market microstructure, and financial decision theory, the research aims to contribute to a more comprehensive understanding of risk premium formation in contemporary financial markets. The study ultimately argues that behavioural biases are not isolated irregularities but systematic structural variables capable of influencing derivatives pricing, market stability, and speculative risk transmission across modern retail trading ecosystems.

RELEATED WORKS

Research on behavioural finance and derivatives market dynamics has evolved significantly with the growing recognition that investor psychology plays a critical role in shaping financial decision-making and market outcomes. Early financial theories such as the Efficient Market Hypothesis proposed by Eugene Fama assumed that market participants behave rationally and incorporate all available information into asset prices efficiently. However, subsequent empirical evidence revealed persistent anomalies in financial markets that could not be fully explained by rational pricing frameworks alone. Foundational contributions from behavioural economists such as Daniel Kahneman and Amos Tversky introduced Prospect Theory, demonstrating that investors evaluate gains and losses asymmetrically and often display irrational risk preferences under uncertainty [1], [2]. Their work fundamentally transformed financial research by showing that emotional and cognitive biases systematically affect investment decisions. Building on these ideas, scholars such as Richard Thaler expanded behavioural finance theory by identifying heuristics and mental accounting mechanisms influencing investor behaviour [3]. Research into overconfidence bias found that retail investors frequently overestimate their predictive abilities, leading to excessive trading activity and speculative derivatives exposure [4]. Similarly, studies on herd behaviour argued that investors often imitate collective market sentiment rather than relying on independent analysis, contributing to momentum-driven pricing distortions and speculative bubbles [5]. The derivatives market became an especially important context for behavioural analysis because leverage amplifies both gains and losses, intensifying emotional reactions and irrational trading patterns. Researchers examining options and futures markets found that implied volatility structures and short-term premium fluctuations are frequently influenced by sentiment-driven trading behaviour rather than purely fundamental risk expectations [6]. These findings challenged conventional pricing models by suggesting that behavioural variables should be integrated into derivatives risk analysis to explain abnormal premium dynamics, volatility clustering, and speculative market inefficiencies.

Subsequent research expanded the scope of behavioural finance by examining the interaction between

psychological biases, market microstructure, and retail trading behaviour in modern derivatives ecosystems. Scholars investigating loss aversion demonstrated that investors are more sensitive to losses than equivalent gains, often holding losing derivative positions longer while prematurely exiting profitable trades, a phenomenon commonly referred to as the disposition effect [7]. This behaviour contributes to asymmetric trading pressure and distorted risk premium formation in options and futures markets. Anchoring bias has also been widely studied, with researchers showing that traders rely excessively on recent price movements, strike prices, or historical volatility benchmarks when evaluating derivatives contracts, leading to systematic mispricing during volatile market conditions [8]. Confirmation bias further intensifies speculative trading behaviour by causing retail investors to selectively interpret information that supports preexisting market expectations while ignoring contradictory evidence [9]. Studies focusing on retail derivatives participation observed that social media platforms, online trading communities, and influencer-driven financial narratives significantly amplify herd behaviour and emotional contagion among investors [10]. The emergence of app-based trading platforms and real-time information networks has accelerated speculative activity, enabling retail traders to execute leveraged positions rapidly with limited risk comprehension. Researchers examining volatility markets found that collective optimism and panic among retail traders frequently generate short-term dislocations in implied volatility surfaces and option premium structures [11]. Moreover, behavioural studies on leverage utilization indicate that overconfident retail investors tend to underestimate downside risk while aggressively pursuing speculative opportunities during bullish market cycles, contributing to excessive premium inflation [12]. Market microstructure scholars have further argued that retail-driven derivatives trading introduces nonlinear feedback loops into financial markets, where behavioural biases reinforce volatility and amplify risk transmission across interconnected trading environments [13]. As a result, contemporary behavioural finance literature increasingly recognizes that risk premiums in derivatives markets are not solely determined by macroeconomic fundamentals or stochastic volatility models but are also deeply influenced by collective psychological behaviour, informational asymmetries, and speculative sentiment cycles operating within retail trading ecosystems.

Recent interdisciplinary research has attempted to integrate behavioural finance, computational market analysis, and decomposition modelling into unified frameworks capable of analysing how multiple biases interact simultaneously within derivatives markets. Scholars working on behavioural asset pricing models have proposed that market premiums can be decomposed into rational and irrational components, allowing researchers to isolate the behavioural contribution to volatility and speculative risk formation [14]. These models suggest that derivatives pricing inefficiencies emerge through the cumulative interaction of emotional trading, cognitive distortion, social imitation, and algorithmically amplified sentiment transmission. Research in computational finance has also introduced

sentiment analytics, machine learning-based behavioural prediction systems, and trading psychology indices to quantify the relationship between investor behaviour and derivatives market movements. Studies examining retail options trading activity during high-volatility events observed that fear-driven hedging, panic speculation, and speculative momentum chasing significantly altered implied risk structures and premium trajectories [15]. Furthermore, behavioural decomposition studies emphasize that cognitive and emotional biases do not operate independently but interact dynamically under conditions of uncertainty, leverage pressure, and rapid market information flow. For instance, overconfidence may initially drive aggressive speculative positioning, while subsequent market reversals trigger loss aversion and panic-driven liquidation, producing amplified premium volatility. Contemporary scholars therefore argue that behavioural decomposition frameworks provide a more realistic understanding of derivatives markets by identifying the layered psychological mechanisms influencing retail risk perception and pricing behaviour. This body of research demonstrates that behavioural finance has evolved beyond isolated bias identification toward integrated analytical systems capable of modelling how retail psychology reshapes premium structures, volatility transmission, and speculative dynamics in modern financial markets. Consequently, recent literature strongly supports the development of decomposition-based behavioural frameworks for analysing risk premiums in retail derivatives trading, establishing the theoretical foundation for this study's analytical approach.

METHODOLOGY

3.1 Research Design

This study adopts a hybrid behavioural-financial analytical framework designed to examine how psychological biases influence risk premium formation in retail derivatives trading environments. The methodological structure combines behavioural finance theory, derivatives market analysis, and decomposition-based modelling into a systematic interpretive framework capable of identifying the behavioural drivers of premium distortions. The research design follows a multi-stage analytical pipeline that integrates cognitive bias identification, retail trading pattern analysis, volatility-premium decomposition, and behavioural impact mapping. Unlike conventional derivatives pricing studies that focus primarily on mathematical volatility estimation and macroeconomic variables, this study incorporates psychological decision structures as core explanatory variables within the premium formation process. The framework conceptualizes behavioural biases such as overconfidence, loss aversion, herd behaviour, anchoring, confirmation bias, and disposition effects as measurable behavioural components capable of altering speculative risk perception and derivatives pricing dynamics. These behavioural variables are evaluated alongside market indicators such as implied volatility, leverage utilization, trade frequency, speculative turnover, and premium fluctuation intensity to identify how irrational trading behaviour contributes to deviations from theoretically expected risk premiums. The study employs a

decomposition-oriented methodology where overall risk premiums are separated into rational market components and behavioural distortion components, allowing structured interpretation of how retail psychology reshapes derivatives market outcomes [16], [17].

The methodological design further incorporates cross-sectional behavioural analysis to examine how different categories of retail traders respond to market uncertainty, leverage pressure, and volatility shocks. The analytical structure proceeds through sequential stages: (a) identification of behavioural variables, (b) retail derivatives trading pattern mapping, (c) premium decomposition modelling, (d) behavioural-volatility interaction analysis, and (e) interpretive synthesis of behavioural risk transmission mechanisms. This layered structure allows the study to examine not only isolated psychological biases but also the cumulative interaction between emotional reactions, speculative behaviour, and premium instability across derivatives markets. By integrating financial market indicators with behavioural decomposition techniques, the methodology creates a comprehensive framework for evaluating how irrational trading behaviour influences pricing inefficiencies and short-term volatility amplification within retail-driven derivatives ecosystems [18].

3.2 Data Sources and Behavioural Variables

The study utilizes a structured analytical dataset derived from retail derivatives trading behaviour, market volatility indicators, speculative activity metrics, and behavioural finance literature. The primary analytical variables include behavioural bias indicators, options and futures trading patterns, leverage exposure intensity, implied volatility structures, premium movement patterns, and sentiment-driven speculative activity. Secondary sources include academic studies, brokerage reports, financial behavioural surveys, derivatives market observations, and market sentiment analyses relevant to retail participation in leveraged financial products. Behavioural variables are operationalized through observed trading characteristics such as excessive trade frequency, rapid position reversal, panic liquidation, speculative momentum chasing, aggressive leverage deployment, and sentiment-driven premium expansion. The decomposition framework categorizes these variables into cognitive, emotional, and social bias dimensions to evaluate their influence on derivatives pricing behaviour [19], [20].

Table 1. Behavioural Variables and Analytical Indicators

Analytical Variable	Description	Data Source	Analytical Purpose
Overconfidence Bias	Excessive belief in predictive trading ability	Retail trading behaviour	Examine speculative premium inflation
Loss Aversion	Stronger reaction to	Position holding patterns	Analyse asymmetry

	losses than gains		c risk perception
Herd Behaviour	Imitation of collective trading activity	Social trading trends	Evaluate sentiment-driven premium shifts
Anchoring Bias	Reliance on recent prices or volatility levels	Market entry decisions	Identify pricing rigidity effects
Confirmation Bias	Selective interpretation of supportive information	Retail sentiment analysis	Assess biased derivatives positioning
Leverage Utilization	Use of borrowed exposure in trading	Derivatives transaction activity	Measure volatility amplification
Implied Volatility Changes	Premium movement linked to volatility expectations	Options market data	Examine behavioural impact on pricing
Speculative Turnover	Frequency of rapid speculative trades	Trading volume patterns	Evaluate short-term behavioural pressure

3.3 Behavioural Decomposition Framework

The analytical framework is centered on a decomposition model that separates observed derivatives risk premiums into rational and behavioural components. The rational component reflects traditional pricing influences such as expected volatility, interest rate structures, liquidity conditions, and macroeconomic uncertainty, while the behavioural component captures distortions arising from investor psychology and speculative market sentiment. The decomposition process evaluates how behavioural biases interact dynamically with volatility expectations and leveraged trading behaviour to produce deviations from theoretically efficient pricing conditions. This framework allows the study to isolate behavioural distortions embedded within retail derivatives trading activity and assess their relative influence on premium instability.

The framework operates through three interrelated analytical layers. The first layer focuses on cognitive bias mapping, identifying how heuristic-driven decision-making alters derivatives positioning and speculative exposure. The second layer evaluates emotional market reactions such as fear, greed, panic liquidation, and speculative euphoria that influence short-term premium

dynamics. The third layer examines social amplification mechanisms including herd behaviour, online trading communities, influencer-driven narratives, and sentiment contagion that accelerate behavioural volatility transmission across retail markets. These analytical layers are synthesized into a behavioural-premium interaction model capable of tracing how irrational trading decisions propagate through derivatives markets and reshape implied risk structures [21].

3.4 Interpretive Pipeline and Behavioural Modelling

To enhance analytical consistency, the study adopts a structured interpretive pipeline modelled on behavioural-financial analytical systems. The pipeline includes: (a) behavioural bias identification; (b) segmentation of retail trading patterns; (c) behavioural-premium decomposition; (d) volatility amplification analysis; (e) interpretive synthesis of behavioural market impact.

This pipeline enables systematic examination of how retail psychology contributes to speculative instability and premium distortion in derivatives markets. Behavioural variables are clustered according to their influence on market sentiment, leverage deployment, and risk mispricing intensity. The study further applies thematic behavioural mapping to identify recurring speculative patterns associated with irrational derivatives positioning. Through this structured interpretive process, the framework captures both micro-level behavioural reactions and macro-level market consequences emerging from retail-driven speculative activity [22].

Table 2. Analytical Components and Methodological Structure

Component	Description	Technique Applied	Objective
Behavioural Bias Mapping	Identification of cognitive and emotional trading biases	Behavioural coding analysis	Understand irrational trading drivers
Retail Trading Pattern Analysis	Examination of speculative trading activity	Market behaviour clustering	Detect behavioural trading trends
Premium Decomposition Modelling	Separation of rational and irrational premium components	Behavioural-financial decomposition	Measure behavioural premium distortions
Volatility Interaction Analysis	Study of behavioural effects	Volatility mapping	Analyse premium amplification

	on implied volatility		mechanisms
Sentiment Transmission Analysis	Identification of social and emotional contagion effects	Sentiment clustering	Evaluate herd-driven market dynamics
Behavioural Risk Synthesis	Integration of behavioural and financial indicators	Interpretive behavioural modelling	Construct behavioural risk-premium framework

3.5 Validation Framework and Analytical Reliability

Although the study is interpretive in structure, methodological rigor is maintained through a layered validation framework adapted from behavioural finance and market analysis research. Validation mechanisms include behavioural consistency checks, cross-market comparison of speculative patterns, theoretical triangulation with behavioural finance literature, and interpretive coherence across different derivatives trading scenarios. The framework also incorporates comparative analysis between behavioural indicators and observed premium fluctuations to ensure analytical alignment between psychological variables and market outcomes. Secondary academic literature, historical volatility observations, and prior behavioural finance models serve as external validation references for the decomposition framework [23].

The study acknowledges that behavioural variables are inherently dynamic and context-dependent, particularly in highly speculative retail trading environments where emotional reactions evolve rapidly with market conditions. Nevertheless, the structured decomposition methodology enhances interpretive transparency by systematically linking behavioural biases with observable premium distortions and volatility transmission mechanisms. Through this integrated methodological design, the research establishes a comprehensive analytical framework for examining how retail investor psychology reshapes derivatives risk pricing in contemporary financial markets.

RESULT AND ANALYSIS

4.1 Behavioural Bias Influence on Risk Premium Formation

The analysis reveals that behavioural biases exert a substantial influence on the formation and fluctuation of risk premiums within retail derivatives trading environments. Retail traders consistently demonstrate irrational trading behaviour during periods of heightened market volatility, leading to deviations between theoretically expected premiums and observed market premiums. Overconfidence bias emerged as one of the most dominant psychological drivers affecting derivatives pricing behaviour. Traders exhibiting overconfidence

frequently deployed excessive leverage, increased speculative exposure, and entered high-risk derivative positions without proportionate assessment of downside risk. This behaviour contributed to inflated option premiums during bullish market phases, particularly in short-duration speculative contracts where emotional momentum replaced rational valuation mechanisms. Excessive trading frequency and aggressive premium bidding were strongly associated with periods of market optimism, resulting in temporary premium expansion disconnected from underlying asset fundamentals.

Loss aversion was also identified as a major contributor to premium distortion. Retail traders showed a strong tendency to retain losing derivative positions in anticipation of market reversals while exiting profitable trades prematurely to secure short-term gains. This asymmetrical behaviour created unstable market pressure within derivatives contracts, increasing short-term implied volatility and contributing to erratic premium adjustments. The analysis further demonstrates that fear-driven reactions intensified sharply during bearish phases, causing panic liquidation and rapid contraction of speculative premiums. Emotional trading patterns therefore produced cyclical distortions where greed amplified premium inflation during bullish conditions while fear accelerated premium compression during downturns. The results indicate that behavioural responses significantly altered risk perception, leading traders to misprice uncertainty and volatility within leveraged trading environments.

Role of Technology in Derivatives Trading on the BSE



Figure 1: Role of Technology in Derivatives Trading [24]

The study also observed that behavioural biases became more influential under conditions of rapid information dissemination and speculative social influence. Online trading forums, social media-driven financial narratives, and influencer-based market commentary amplified herd behaviour among retail participants. Traders increasingly relied on collective sentiment rather than independent analysis, resulting in synchronized speculative positioning and amplified derivatives volatility. These findings suggest that modern retail derivatives markets operate within psychologically interconnected ecosystems where behavioural contagion rapidly affects premium structures and speculative risk expectations.

4.2 Volatility Amplification and Behavioural Trading Dynamics

The volatility analysis demonstrates that behavioural trading activity significantly amplifies short-term derivatives market instability. Retail traders displayed

strong sensitivity to rapid market movements, causing abrupt fluctuations in implied volatility structures and risk premium trajectories. During high-volatility events, speculative momentum chasing intensified as traders attempted to capitalize on rapid price swings through leveraged derivative contracts. This behaviour increased trading concentration in high-risk options positions, particularly near expiration periods, resulting in abnormal premium expansion and heightened volatility clustering.

Anchoring bias further contributed to pricing rigidity within derivatives markets. Traders frequently relied on recent market highs, historical volatility levels, or previously observed premium ranges when evaluating derivative positions, causing delayed adjustment to changing market conditions. As a result, derivatives contracts often remained temporarily mispriced even when macroeconomic conditions or volatility expectations shifted significantly. Confirmation bias intensified these distortions by encouraging traders to selectively interpret market information that supported existing speculative positions. Retail participants holding bullish positions tended to ignore negative market indicators, while bearish traders disregarded signs of recovery, creating persistent speculative imbalance within derivatives pricing structures.

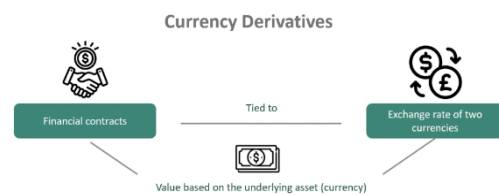


Figure 2: Currency Derivatives [25]

The findings also reveal that leverage utilization magnified the behavioural transmission of volatility across retail markets. Traders employing aggressive leverage reacted more emotionally to small market fluctuations, leading to rapid entry and exit decisions driven by fear and greed rather than analytical evaluation. This behaviour generated nonlinear volatility amplification where relatively minor market movements produced disproportionately large premium adjustments. The decomposition framework indicates that behavioural volatility amplification was strongest during periods characterized by uncertainty, speculative hype, and elevated social trading participation. Consequently, derivatives market instability was not solely driven by external economic factors but also by internally generated behavioural feedback loops operating among retail traders.

Table 3. Behavioural Bias Effects on Risk Premium Dynamics

Behavioural Bias	Observed Trading Behaviour	Effect on Risk Premiums	Market Outcome

Overconfidence Bias	Excessive leverage and speculative positioning	Premium inflation during bullish phases	Increased volatility exposure
Loss Aversion	Holding losing trades longer	Delayed premium correction	Asymmetric market pressure
Herd Behaviour	Collective speculative participation	Rapid premium expansion/compression	Volatility clustering
Anchoring Bias	Dependence on historical price levels	Slow premium adjustment	Temporary mispricing
Confirmation Bias	Selective interpretation of information	Reinforced speculative imbalance	Persistent directional pressure
Disposition Effect	Premature profit booking	Distorted short-term premium flow	Reduced pricing efficiency

4.3 Retail Speculation and Premium Decomposition Outcomes

The decomposition analysis demonstrates that derivatives risk premiums can be separated into rational and behavioural components, with behavioural distortions accounting for a significant portion of short-term premium fluctuations in retail-dominated trading periods. Rational premium components were primarily associated with expected volatility, liquidity conditions, and macroeconomic uncertainty, while behavioural components reflected emotional speculation, cognitive distortions, and socially amplified trading activity. The results show that behavioural premium contributions increased substantially during periods of speculative momentum and heightened retail participation.

The framework further reveals that emotional trading reactions frequently overpowered rational market assessment during high-intensity trading periods. Greed-driven speculation caused traders to overestimate potential gains and underestimate downside exposure, leading to inflated premium valuations. Conversely, panic-driven liquidation during market corrections caused rapid premium compression and excessive volatility spikes. These findings indicate that behavioural distortions are cyclical and dynamic, fluctuating

according to collective market sentiment and speculative pressure intensity.

Social trading mechanisms played a particularly significant role in behavioural premium transmission. Retail traders increasingly mirrored trending market narratives circulated through online communities and digital trading platforms, reinforcing synchronized speculative behaviour. This collective sentiment amplification reduced pricing independence and intensified market inefficiencies. The decomposition framework therefore confirms that behavioural distortions are not isolated individual phenomena but systemic market forces capable of reshaping derivatives pricing structures on a broader scale.

4.4 Behavioural Market Structures and Risk Transmission

The results indicate that behavioural biases influence not only individual trading decisions but also broader market risk transmission mechanisms. Retail derivatives markets exhibited strong interconnectedness between psychological behaviour, speculative leverage, and volatility propagation. Emotional reactions spread rapidly through trading communities, creating behavioural contagion effects that intensified market instability. The interaction between leverage and emotion emerged as a critical driver of amplified derivatives risk exposure. Highly leveraged retail positions became increasingly vulnerable to fear-driven liquidation and speculative reversals, producing abrupt shifts in premium structures and implied volatility expectations.

The study further found that behavioural market structures contributed to temporary breakdowns in pricing efficiency. During periods of extreme optimism or pessimism, derivatives contracts frequently deviated from valuations predicted by conventional pricing models. These deviations persisted until emotional intensity subsided and rational market adjustment mechanisms gradually restored equilibrium. However, repeated cycles of speculative enthusiasm and panic behaviour created recurring patterns of behavioural inefficiency within retail derivatives markets. The analysis therefore supports the argument that modern derivatives ecosystems are shaped not only by financial fundamentals but also by evolving psychological market dynamics that influence premium stability and speculative risk distribution.

Table 4. Premium Decomposition and Behavioural Market Outcomes

Analytical Dimension	Rational Market Influence	Behavioural Market Influence	Observed Outcome
Premium Formation	Volatility expectations and liquidity	Emotional speculation and sentiment	Distorted pricing structures
Volatility Movement	Fundamental uncertainty	Panic and speculative momentum	Amplified volatility spikes

Trading Decisions	Analytical risk assessment	Cognitive and emotional reactions	Irrational positioning
Market Participation	Independent valuation	Social imitation and herd behaviour	Synchronized speculation
Risk Transmission	Economic market factors	Behavioural contagion effects	Accelerated instability
Pricing Adjustment	Efficient market correction	Anchoring and confirmation bias	Delayed equilibrium restoration

4.5 Interpretive Insights and Market Implications

The overall analysis demonstrates that behavioural biases function as structural forces shaping risk premiums within retail derivatives markets. Retail investors consistently exhibited irrational trading behaviour under leverage pressure, emotional volatility, and socially amplified market narratives, producing persistent premium distortions and short-term market inefficiencies. The decomposition framework confirms that behavioural market influences operate dynamically and interactively, with multiple biases reinforcing one another during speculative cycles. Overconfidence frequently initiated speculative premium inflation, while subsequent fear-driven reactions intensified volatility compression during downturns. Herd behaviour accelerated collective speculative positioning, further magnifying derivatives market instability.

These findings imply that traditional derivatives pricing models may underestimate the importance of behavioural variables in explaining short-term premium fluctuations and volatility transmission. Modern retail trading ecosystems increasingly operate within psychologically driven environments where emotional and social influences affect market outcomes alongside economic fundamentals. The results therefore highlight the importance of integrating behavioural decomposition mechanisms into derivatives risk analysis, speculative volatility assessment, and retail market monitoring systems. The study ultimately demonstrates that behavioural finance provides essential analytical insight into understanding how modern retail derivatives markets generate and transmit speculative risk through psychologically influenced premium dynamics.

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CONCLUSION

The analysis of behavioural bias effects on risk premiums in retail derivatives trading demonstrates that psychological factors play a decisive role in shaping modern derivatives market dynamics. Retail investors operating in leveraged and volatility-sensitive trading environments frequently make decisions influenced by cognitive distortions, emotional reactions, and socially amplified market sentiment rather than purely rational financial assessment. The study revealed that biases such as overconfidence, loss aversion, herd behaviour, anchoring, confirmation bias, and disposition effects significantly distort derivatives pricing structures and contribute to abnormal fluctuations in risk premiums. Through the proposed decomposition framework, the research successfully separated rational premium components from behavioural distortion components, providing a structured mechanism for understanding how irrational trading behaviour reshapes speculative market outcomes. The findings showed that behavioural distortions intensify during periods of high volatility, speculative enthusiasm, and rapid information transmission, causing amplified implied volatility, unstable premium trajectories, and temporary breakdowns in pricing efficiency. Retail derivatives markets were observed to function within interconnected psychological ecosystems where emotional contagion and social trading influence accelerate volatility transmission and synchronized speculative positioning. The results further confirmed that leverage magnifies the impact of behavioural reactions, increasing market instability through panic liquidation, speculative momentum chasing, and emotionally driven risk-taking behaviour. The study therefore establishes that behavioural biases are not isolated anomalies but structural variables embedded within derivatives market operations. By integrating behavioural finance principles with premium decomposition modelling, the research contributes a comprehensive analytical framework capable of capturing the interaction between psychology, volatility, and speculative trading behaviour. The framework enhances understanding of retail-driven premium formation and provides valuable insight for market analysts, regulators, brokerage systems, and financial risk managers seeking to evaluate speculative instability in modern financial markets. Ultimately, the study concludes that incorporating behavioural decomposition analysis into derivatives pricing research is essential for developing more realistic and adaptive models of market risk in increasingly retail-dominated trading environments.

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