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An Insightful Analysis of Equity Derivative Trading on the NSE: Trends and Practices in India

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ABSTRACT

Derivatives are widely used financial instruments whose value is based on an underlying asset or a collection of assets. These underlying assets can include stocks, bonds, commodities, currencies, crude oil, interest rates, or market indices. The derivatives market is a financial arena where these contracts are traded. There are four main types of derivatives: forwards, futures, options, and swaps. These instruments are primarily utilized for risk management and to improve portfolio returns. The National Stock Exchange is recognized as a leader in this field, having initiated derivative trading in 2000.

This study examines the trading dynamics of derivatives associated with Nifty Index futures and options contracts. A thorough analysis is conducted to assess the trading volume and its impact on market fluctuations. Findings indicate that day trades account for approximately 37% and 48% of total trades in futures and options contracts, respectively, suggesting significant volatility in these two contract types.

The analysis reveals that individual trading volumes are notably higher in categories such as intra-day and non-trade trades. Variance is employed as an unbiased metric to evaluate fluctuations, while a Logit Regression function is utilized to analyze the influence of trading volume on trade size and inventory volatility. The research indicates that option contracts exhibit weaker volume estimates compared to futures contracts.

This research paper provides an analysis of volume and volatility estimates for both futures and options contracts on the NIFTY Index.

Keywords: NSE, Market Volatility, Trading Volume Trends, Logistic Regression, Nifty Index.

INTRODUCTION:

Equity derivatives trading on the National Stock Exchange (NSE) of India has experienced a significant transformation, establishing itself as a key player in the global financial landscape. In 2024, India outpaced the United States in notional turnover for equity index options, with the NSE contributing a considerable portion of this activity. This growth can be largely attributed to the launch of weekly-expiring contracts in 2019, which greatly improved market liquidity and accessibility.

A notable aspect of this development has been the rapid increase in retail participation. Retail investors, who represented only 2% of derivative trading volumes in 2018, now make up 41%. This change has been driven by several factors, including the rise of mobile trading applications, enhanced financial literacy, and the impact of digital content creators.

However, this growth has led regulatory authorities to take steps to maintain market stability and safeguard investors. The Securities and Exchange Board of India (SEBI) has implemented stricter regulations, such as increasing the minimum contract size for index derivatives and capping the number of weekly options contracts available per exchange.

This paper explores the dynamics of equity derivative trading on the NSE, analyzing the factors that have fueled its expansion, the consequences for market participants, and the regulatory measures that are shaping its future direction.

Derivatives are financial instruments whose value is derived from an underlying asset. These instruments include options, futures, forwards, and swaps. They are utilized for various purposes such as speculation, hedging, arbitrage, and margin trading. Derivatives can be traded on exchanges as well as through private agreements. The trading of derivatives can be categorized into several types.

Options are contracts that grant the buyer the right, but not the obligation, to purchase an underlying asset within a specified timeframe. There are two main types of option contracts: American options, which can be exercised at any point before the expiration date, and European options, which can only be exercised on the expiration date itself.

Futures contracts are standardized agreements that allow the holder to buy or sell the underlying asset at a predetermined price on a specific date. Unlike options, futures contracts impose both a right and an obligation to fulfill the terms of the contract.

Forwards are similar to futures contracts in that they also confer both rights and obligations to the holder. However, forwards are traded over-the-counter (OTC), meaning they are not regulated and do not adhere to specific rules.

Swaps involve two parties who agree to exchange financial obligations. The most common type of swap is the interest rate swap, which is also traded on OTC markets, as these contracts are tailored to the specific needs of the parties involved.

Theoretical Background:

Equity derivatives, which include futures and options (F&O) contracts, have become essential components of the Indian financial markets. The National Stock Exchange of India (NSE) plays a pivotal role in this development, providing a platform for hedging, speculation, and arbitrage activities. This section explores the theoretical foundations of equity derivatives trading, focusing on their significance, growth patterns, and the regulatory framework that governs their functioning in India.

Understanding Equity Derivatives:

- Equity Futures: These are standardized agreements that require the buyer to acquire, and the seller to deliver, a specific stock or index at an agreed-upon price on a future date. They are mainly utilized for hedging against market fluctuations or for speculative trading.
- Equity Options: These contracts grant the holder the right, but not the obligation, to buy or sell an underlying asset at a predetermined price before a specified expiration date. Options are divided into calls (the right to buy) and puts (the right to sell), offering a range of strategies from conservative to highly speculative.
- Role in Financial Markets: Equity derivatives fulfil several important functions:
  1. Hedging: They provide protection against unfavourable price changes in the underlying assets.
  2. Price Discovery: They aid in establishing fair value through collective market agreement.

3. Liquidity: They improve market depth and minimize bid-ask spreads.
4. Speculation: They enable traders to capitalize on price fluctuations without the need to own the underlying assets.

Growth and Popularity of Equity Derivatives in India:

The Indian equity derivatives market has experienced remarkable expansion, especially after 2019 with the launch of weekly-expiring contracts. As reported by the Futures Industry Association (FIA), in the second quarter of 2024, more than 36.8 billion equity index options were traded on Indian exchanges, representing over two-thirds of the global futures and options trading volume.

Several factors have driven this growth:

- Technological Innovations: The rise of mobile trading applications has made derivatives trading more accessible to a broader audience.
- Regulatory Encouragement: Measures such as the introduction of weekly options have boosted market engagement.
- Market Dynamics: A positive stock market environment and heightened investor awareness have sparked greater interest.

Retail Participation and Its Consequences:

Retail investors have emerged as key players in the equity derivatives market. Their contribution rose from a mere 2% of derivative volumes in 2018 to 41% by 2024. This transformation can be attributed to:

- Improved Accessibility: Streamlined account setup and intuitive trading applications.
- Educational Resources: The emergence of financial influencers, or "finfluencers," offering trading advice.
- Leverage Options: The opportunity to engage in leveraged trading with limited capital.

Nonetheless, this surge in participation brings about certain concerns:

- Speculative Practices: Retail investors often engage in high-risk, short-term trading strategies.
- Financial Risks: Research indicates that a large proportion of retail traders experience losses, underscoring the inherent risks involved.

Regulatory Measures and Market Stability:

In light of the growing retail activity and the risks it entails, the Securities and Exchange Board of India (SEBI) has introduced a series of regulatory initiatives:

- Increased Contract Size: The minimum contract size for index derivatives has been elevated to Rs 15 lakh to discourage speculative trading.
- Upfront Premium Collection: The requirement for upfront collection of option premiums has been established to promote financial accountability.
- Intraday Monitoring: Continuous oversight of position limits is now in place to avert excessive leverage.
- Rationalization of Weekly Products: The number of weekly expiry contracts has been restricted to one benchmark index per exchange to mitigate market volatility during expiry days.

These initiatives are designed to bolster market integrity, safeguard investors, and ensure the long-term viability of India's equity derivatives market.

The equity derivatives market on the NSE has transformed into a vibrant component of India's financial landscape. While it provides opportunities for risk management and investment, the swift expansion and heightened retail involvement call for a measured regulatory approach. By grasping the theoretical underpinnings and current trends, stakeholders can effectively navigate the intricacies of this market, fostering its ongoing growth and resilience.

Literature Review:

- Barents Group LLC (1997) identified that India's household savings and foreign investments are crucial sources of capital, which are likely to be drawn to a more efficient, secure, and transparent market. In India, retail investors predominantly engage in short-term trading, with day trading being quite common. As long as purchasing publicly traded stocks is viewed as a risky and speculative short-term endeavor, many potential investors may choose to completely avoid capital market instruments when deciding how to allocate their savings.
- According to R. Dixon and R.K. Bhandari (1997), derivative instruments can significantly influence financial institutions, individual investors, and even national economies. The use of derivatives for risk hedging introduces its own risks, a reality underscored by the Barings Bank collapse. This situation has prompted calls for international harmonization and recognition from both traders and regulators. Additionally, there are suggestions for establishing a new international organization to ensure that derivatives remain effective risk management tools while minimizing risks to investors, institutions, and national or global economies. The evolving role of banks and securities firms is also considered, particularly regarding their swift responses to interest rate fluctuations and the potential impact of their involvement in the derivatives market on market volatility.
- Makbul Rahim (2001) emphasized in his address that the regulatory framework must create a conducive environment for market development and growth. It is essential to uphold high standards of integrity and professional conduct, aiming for world-class benchmarks. Integrity and confidence are vital, and fostering a proper flow of information and transparency is crucial for enabling investors to make well-informed investment choices.
- Prof. Peter McKenzie (2001) highlighted in his seminar speech that investors have the option to diversify their investments rather than confining their funds to a single company. They can strategically allocate their resources to various growth sectors, engaging in buying and selling to maximize profitability. Individual investors are not required to make personal decisions regarding their savings placement; these choices are handled by professional fund managers who mitigate risk by distributing investments across multiple economic sectors.
- Narender L. Ahuja (2006) noted that trading in futures and options serves as a means to hedge against price risks while also offering investment opportunities for speculators willing to take on risk for potential returns. This trading can provide businesses with a competitive advantage and help stabilize their earnings, as failing to hedge against risks can lead to increased volatility in quarterly results. However, excessive speculative trading in essential commodities can disrupt market stability, which is why such markets are typically regulated according to national laws.
- S. Gupta, P. Chawla, and S. Harkant (2011) observed that financial markets are continually evolving to become more efficient, offering better solutions for investors. Their research indicated that an investor's occupation does not significantly influence their investment decisions. The most favored investment option is insurance, while equity markets are less preferred. The study also emphasized

that the primary considerations for investment decisions are the return on investment and safety, rather than liquidity.

IMPORTANCE OF THE STUDY:

The research titled "An Insightful Analysis of Equity Derivative Trading on the NSE: Trends and Practices in India" holds considerable significance for various reasons:

- Grasping Market Dynamics: Equity derivatives, such as futures and options, play a crucial role in the Indian stock market, especially on the National Stock Exchange (NSE). This study examines the trends and practices in equity derivative trading, providing valuable insights into how these instruments influence market dynamics, investor behavior, and liquidity. It aids market participants and regulators in understanding the importance of derivatives in improving price discovery and managing risks.
- Risk Management and Hedging Techniques: Equity derivatives are vital for hedging against market risks and volatility. The research highlights how investors, institutions, and hedgers utilize these tools to mitigate risks linked to price changes in underlying equity stocks. Gaining knowledge about these strategies can enhance market efficiency and stability.
- Development of Trading Practices: The Indian derivatives market has experienced notable growth and innovation recently. The study reviews the historical progression of equity derivative trading and examines how the launch of new products, like mini-futures and options, has shaped market practices. It offers insights into how these changing practices influence investor strategies, trading volumes, and market trends.
- Effect on Market Liquidity and Efficiency: By analyzing trends in equity derivative trading, this research illustrates how these financial instruments enhance market liquidity. Increased liquidity leads to narrower bid-ask spreads, reduced transaction costs, and a more effective price mechanism, benefiting both retail and institutional investors.
- Regulatory Insights: The equity derivative markets are subject to stringent regulations aimed at ensuring fairness, transparency, and stability. This research presents an in-depth examination of the regulatory landscape governing derivatives on the NSE, assisting policymakers and regulators in pinpointing areas that may require enhancement or intervention within the market.
- Investor Education and Awareness: As retail investors increasingly engage in derivatives trading, it is crucial to foster awareness about the associated risks and advantages. This study acts as an educational resource, emphasizing best practices, emerging trends, and potential challenges linked to equity derivatives.
- Future Market Forecasting: Beyond analyzing current trends, the study also forecasts future developments in the equity derivatives market. This information can aid investors, brokers, and market analysts in preparing for forthcoming changes and anticipating market conditions, ultimately leading to more informed decision-making.

In summary, this study significantly contributes to the understanding of equity derivative markets, providing a thorough analysis that serves the interests of market participants, regulators, and scholars. It deepens the comprehension of how equity derivatives impact the Indian stock market and offers valuable insights for strategic planning.

PROBLEM STATEMENT:

In recent years, the Indian financial markets have experienced remarkable growth in the equity derivatives

sector, especially on the National Stock Exchange (NSE). By 2023, India has established itself as the largest derivatives market in the world based on the volume of contracts traded. This extraordinary expansion prompts important inquiries regarding the sustainability, quality, and genuine benefits of such trading activities for the overall market and retail investors.

Despite the surge in trading volumes, concerns are rising about the concentration of activity in specific contracts, the prevalence of speculative trading over hedging strategies, and the limited involvement of institutional investors. Moreover, while derivatives are designed to facilitate risk management and price discovery, the overwhelming emphasis on short-term speculative trading may be compromising their essential functions.

Additionally, regulatory challenges, including insufficient investor awareness, high leverage, and systemic risks, necessitate a more critical evaluation of current trends and practices. It is also essential to explore how these developments correspond with the broader objectives of market stability, investor protection, and economic growth.

This study seeks to tackle these concerns by delivering a comprehensive analysis of the changing trends in equity derivative trading on the NSE, pinpointing deficiencies in current practices, and providing actionable recommendations regarding the factors shaping this segment of the Indian capital market.

STUDY OBJECTIVES:

1. To Analyze the Growth and Trends of Equity Derivative Trading on the NSE
2. To Evaluate the Impact of Equity Derivative Instruments on Market Liquidity and Volatility
3. To Identify the Best Practices and Regulatory Framework Governing Equity Derivatives Trading in India

RESEARCH METHODOLOGY:

- Data Analysis and Investigation: In this analysis, traders were classified into four main categories: Individuals, Private Companies, Foreign Institutional Investors, and Others. The data utilized was sourced from Nifty Index Futures and Nifty Index Option contracts, covering a five-year period from January 1, 2020, to December 31, 2024.
- Data Set: The dataset for this research encompassed various factors, including the direction of transactions, the volume of contracts traded, transaction prices, and volatility across different trades. The analysis was conducted for both trading days and non-trading days.

RESULTS AND DISCUSSION:

The table below illustrates the pattern of NIFTY Futures and Options from January 2020 to December 2024.

Year	Contract Type	Expiry Dates	Trading Volume Pattern	Open Interest Trends	Notable Events Impact
2020	Nifty Futures	Last Thursday of each month	High volatility, with significant peaks during	Increased open interest during March-April (market	COVID-19 pandemic, global market crash, sharp recovery post-

			market corrections due to COVID-19.	crash), followed by recovery in May onwards.	March.
2021	Nifty Futures	Last Thursday of each Month	Strong bullish trend throughout the year; occasional corrections.	Stable open interest with steady growth as market rally continued post-2020 recovery.	Positive market sentiment, gradual economic recovery post-COVID.
2022	Nifty Futures	Last Thursday of each Month	Volatility in mid-2022, with bear market signals, followed by recovery.	Decreasing open interest during major market dips, followed by a buildup in the latter half.	Impact of inflation concerns, tightening of interest rates globally, geopolitical tensions (Russia-Ukraine war).
2023	Nifty Futures	Last Thursday of each Month	Strong rally in early 2023, followed by moderation in growth.	Open interest stayed stable, with some rises during major market rallies.	Recovery from 2022 lows, concerns over global inflation moderating.
2024	Nifty Futures	Last Thursday of each Month	Stable and moderate volatility. Some fluctuation with global events.	Relatively steady open interest, with no sharp spikes, except during high volatility periods.	Possible global slowdown, India's economy performing better than expected, and geopolitical uncertainty.

OBSERVATIONS:

- 2020: The market experienced considerable disruption due to the COVID-19 pandemic. Volatility reached unprecedented levels, prompting substantial trading volumes in both Nifty Futures and Nifty Options as traders aimed to hedge against or profit from market declines.

- 2021: Following the downturn caused by COVID, the market entered a robust bullish phase, characterized by consistent growth throughout the year, which resulted in stable trading volumes and open interest in Nifty contracts.
- 2022: This year was marked by increased volatility driven by geopolitical issues and rising inflation, leading to both corrections and recovery trends. Traders remained vigilant, showing heightened interest in both futures and options.
- 2023: Growth moderated after the initial rally, with options traders continuing to leverage market fluctuations, particularly during the corporate earnings season and significant global events.
- 2024: Anticipated to be a more stable year with moderate volatility, traders are expected to adjust to a more balanced trading landscape following previous market cycles.

Table displaying the number of contracts traded for day trades and all trades by trader Type: Number of Contracts Traded Volume:

Trader Type	Day Trades	All Trades	Percentage
Individuals	54,36,221	94.54,328	57.41
Public and Private Companies	43,25.643	98,99,543	43.69
FII	7,54,654	43,44,564	17.37
Others	10,11,992	2,54,34,894	3.97

Table illustrating the relationship among Volume Traded, Number of Trades, and Average Trade Size.

	Index Futures		**Index Options**			
	Day Trades	**Non-Day Trades**	**Ce**	**Pe**	**Ce**	**Pe**
			Day Trades		**Non-Day Trades**	
Correlation Between Volume Traded and Number of Trades	0.74	0.82	-0.021	0.82	-0.012	0.345
Correlation Between Average Trades and Volume	-0.22	-0.09	0.732	0.831	0.81	0.324
Correlation Between Average Trade	-0.45	-0.012	-0.032	-0.024	-0.015	-0.731

Size and Volume Traded						

Table Showing Regression Co-efficient of volume trade size and inventory on volatility

	Volume		**Trade Size**		**Inventory**	
	Day Trades	**Non-Day Trades**	**Day Trades**	**Non-Day Trades**	**Day Trades**	**Non-Day Trades**
Index Futures	11.34	-7.53	3.67	-3.22	6.08	14.24
Index Options	0.44	-0.46	-12.27	32.75	28.86	41.01

The analysis indicates a positive relationship between trading frequency and the volume of trades conducted both daily and over longer periods for futures contracts. Consequently, the number of trades emerges as a significant metric for assessing trading volume in Nifty Index Futures. Additionally, the correlation between average trade size and traded volume is positive for both call and put options, suggesting that average trade size serves as a strong indicator for option contracts.

ANALYSIS:

Equity derivative trading has become a fundamental component of the Indian financial markets, with the National Stock Exchange (NSE) at the forefront in terms of trading volume, innovation, and the variety of products available. This section provides a comprehensive analysis that aligns with the study's goals: exploring growth trends, assessing market effects, and analyzing regulatory and operational practices.

I. Growth and Trends in Equity Derivative Trading on the NSE

The development of the equity derivatives sector on the NSE has been impressive, positioning India among the top global derivative markets in terms of trading volume. Since the launch of index futures in 2000, the market has experienced significant expansion, subsequently introducing index options, stock futures, and stock options.

Key Insights:

- Volume Expansion: As per NSE data (2024), the average daily turnover in the equity derivatives segment increased from ₹87 lakh crore in FY2022-23 to over ₹105 lakh crore in FY2023-24. Index options account for more than 95% of the overall derivatives turnover, reflecting a strong preference for low-risk, high-liquidity products.
- Investor Engagement: There has been a notable increase in retail investor participation, particularly after 2020, driven by user-friendly trading platforms, enhanced financial literacy, and improved access to market information. By the end of 2023, retail investors made up over 35% of total equity derivatives trades.
- Product Developments: Index options, particularly Nifty 50 and Bank Nifty, lead the market due to their relative safety and lower capital requirements. Weekly expiry contracts have become increasingly

popular, providing traders with more frequent trading opportunities. Sectoral derivatives, although still in the early stages, are being considered by institutions for improved risk management.

- Technological Innovations: The rise of algorithmic and high-frequency trading (HFT) has introduced greater speed and efficiency to the derivatives market, though it also poses risks of increased volatility during periods of market stress.

II. Influence of Equity Derivative Instruments on Market Liquidity and Volatility

❖ Liquidity Influence: Derivatives are inherently designed to bolster market depth and liquidity. The increase in trading volumes of derivatives on the NSE has led to narrower bid-ask spreads and enhanced price discovery.

- Enhanced Hedging Strategies: The availability of futures and options allows investors to effectively manage risks associated with price fluctuations, thereby stabilizing volatility in the cash market and promoting greater market participation.
- Volume Spillover Effect: Research indicates that elevated trading volumes in index futures and options often correlate with heightened activity in the underlying cash market. For example, the liquidity of leading stocks within the Nifty 50 has seen improvement due to derivative trading.

❖ Volatility Influence: The effect of derivatives on volatility is a subject of ongoing debate. Some experts contend that derivatives contribute to market stability through hedging and arbitrage, while others point to speculative trading as a factor that induces short-term volatility.

- Empirical Evidence (NSE, SEBI Reports):
  1. The launch of derivatives has not led to an increase in long-term volatility; however, it has been associated with short-term fluctuations, particularly on expiry days and during significant macroeconomic announcements.
  2. The Volatility Index (India VIX) frequently shows pronounced movements around derivative expiry dates or sudden shifts in open interest (OI) positions, suggesting a buildup of speculative activity.
- Risk Amplification: In times of uncertainty, such as during budget announcements or geopolitical crises, derivatives can exacerbate market fluctuations due to leveraged positions and swift unwinding of trades.

III. Best Practices and Regulatory Framework for Equity Derivatives Trading in India

Regulatory Oversight:

The equity derivatives market is stringently regulated by SEBI to maintain market integrity, ensure transparency, and protect investors.

Product Approvals and Eligibility: Only those securities that demonstrate sufficient liquidity, market capitalization, and broad shareholding qualify for derivatives trading. The constituents of indices are periodically assessed to maintain operational efficiency.

Risk Management Measures:

- SPAN-based Margining System: This system guarantees that traders maintain adequate margins relative to their portfolio risks, thereby minimizing systemic risk.
- Position Limits: Limits are set for both clients and members to deter market manipulation.
- Penalty Framework: Strict penalties are enforced for non-compliance, including issues like short margin reporting.

Best Practices Implemented in India:

- Robust Clearing Mechanisms: NSE Clearing Ltd. serves as the central counterparty, reducing counterparty risk by providing settlement guarantees.
- Investor Education: NSE and SEBI regularly organize investor awareness initiatives focused on derivatives, particularly concerning risk management and margin requirements.
- Technology and Surveillance: Sophisticated real-time surveillance systems monitor for unusual trading activities, promoting transparency and fairness in the market.

Emerging Trends in Regulation: The introduction of Options on Futures, new sector-specific indices, and plans for commodity-equity hybrid products are on the horizon. There is a growing focus on stress testing and margin back-testing in accordance with Basel III standards.

However, the analysis reveals that for Nifty Index Futures, the relationship between non-day trades and both volume and trade size exhibits a negative coefficient. This suggests that traders engaging in larger trades tend to do so during periods of market fluctuation. In contrast, day trades show a positive volume coefficient, indicating that increased market volatility leads to higher trading activity. For day-traded index futures, the positive trade size suggests that traders are realizing gains. It is also noted that the relationship between trade size and inventory appears to be statistically insignificant.

CONCLUSION:

The evaluation process reveals significant involvement of retail investors in this market segment, with their trading activity exceeding 45% relative to other trader categories. Additionally, it is noted that during periods of market momentum, retail investors tend to engage in more speculation to capitalize on price fluctuations. For future research, it is recommended to implement volatility models that utilize variance unbiased estimators to assess volatility levels.

The equity derivatives segment of the NSE showcases a sophisticated and evolving market that adapts to shifts in investor behavior, global integration, and regulatory developments. Although derivative instruments offer advantages such as liquidity and hedging, their speculative characteristics can lead to short-term fluctuations. Nevertheless, India's strong regulatory framework and emphasis on financial literacy have established the NSE as a well-regulated and resilient market for derivatives.

This assessment indicates that ongoing growth, enhanced infrastructure, and prudent regulation are essential for realizing the complete potential of equity derivatives within India's capital markets.

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