

A Study On Nifty Hedging Opportunities At Basan Equity Broking Limited

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ABSTRACT

The National Stock Exchange (NSE) Nifty 50 index is a key benchmark for the Indian stock market, and investors often face volatility that can impact their portfolios. Hedging strategies play a crucial role in protecting investments from potential losses and managing risk effectively. This study explores various derivative-based hedging techniques, including options and futures, to mitigate market uncertainties. The research examines strategies such as protective puts, covered calls, straddles, strangles, and Nifty futures hedging, assessing their effectiveness in different market conditions. Additionally, the study analyzes how risk-adjusted returns can be optimized using these strategies while considering market trends, implied volatility, and macroeconomic factors. Through historical data analysis and real-world case studies, this study provides insights into the practical application of hedging techniques for institutional and retail investors. The findings aim to enhance risk management practices, helping investors build a resilient and well-balanced investment portfolio in a dynamic financial environment.

INTRODUCTION

Investing in the stock market involves inherent risks due to market volatility, economic fluctuations, geopolitical events, and unforeseen financial crises. The Nifty 50 index, a benchmark index of the National Stock Exchange (NSE) of India, represents the performance of the top 50 companies across various sectors. While the index offers significant growth potential, it also exposes investors to systematic risks. To mitigate these risks and protect investment portfolios from potential losses, investors employ hedging strategies using derivatives such as futures and options. Hedging is a risk management technique that involves taking an offsetting position in a related security to reduce the impact of adverse price movements

NEED FOR THE STUDY

The Indian stock market, particularly its benchmark indices like the NIFTY 50 and Bank NIFTY, has witnessed significant volatility from 2020 to 2025. Events such as the COVID-19 pandemic, geopolitical tensions, monetary policy shifts, inflationary pressures, and changes in investor sentiment have contributed to sharp market movements. Such volatility poses substantial risks to investors, particularly those with concentrated holdings in high-beta sectors like banking. The banking sector, led by top private players such as HDFC Bank, ICICI Bank, Axis Bank, and Kotak Mahindra Bank, is both a driver and a reflection of macroeconomic trends, making it susceptible to systemic risk.

OBJECTIVES OF THE STUDY

1. To analyze the volatility patterns and market risks associated with selected banking stocks (HDFC Bank, ICICI Bank, Axis Bank, and Kotak Mahindra Bank) from 2020 to 2025.
2. To assess the effectiveness of NIFTY and Bank NIFTY derivative instruments (futures and options) in hedging the risks of the selected banking stocks.
3. To compare the risk-adjusted returns of hedged versus unhedged portfolios involving the selected banks during high-volatility periods.
4. To understand the correlation between individual banking stock movements and the NIFTY/Bank NIFTY indices to establish hedging suitability.
5. To provide actionable recommendations for investors and portfolio managers on when and how to implement hedging strategies using index derivatives.

SCOPE OF THE STUDY

The study primarily focuses on analyzing the effectiveness of various hedging strategies using derivatives such as options and futures on the Nifty 50 index and selected major banks' stocks (HDFC, ICICI, Axis, Kotak Mahindra, and IndusInd) during the period 2020 to 2024. The research covers data and market behavior within the five-year period from 2020 to 2024. This timeframe allows the study to capture recent market trends, volatility patterns, and the impact of macroeconomic events on hedging performance.

METHODOLOGY

Methodology

This study employs a quantitative research approach to analyze the impact of hedging strategies using derivatives (options and futures) on the risk and performance of Nifty 50 investment portfolios from 2020 to 2024.

Statistical Analysis

- Descriptive Statistics: Mean returns, standard deviation, skewness, and kurtosis of hedged vs unhedged portfolios.
- Correlation and Beta Analysis: To assess the relationship between bank stock derivatives and Nifty 50.
- Hypothesis Testing:

Paired Sample t-test / Independent Sample t-test to compare average returns and volatility between hedged and unhedged portfolios.

ANOVA (Analysis of Variance) to analyze performance differences across multiple hedging strategies.

LIMITATIONS OF THE STUDY

- 1) The study relies on historical data, which may not fully capture future market conditions.
- 2) The effectiveness of hedging strategies varies based on market sentiment and liquidity.
- 3) Transaction costs and margin requirements are assumed based on standard market practices, but actual costs may differ for individual investors.

REVIEW OF LITERATURE

1. **Rao, A. & Mehta, R. (2020)**

Title: *Sector-Specific Hedging Using NIFTY and Bank NIFTY Futures*

Summary:

This study investigates the hedging efficiency of NIFTY and Bank NIFTY futures in managing sectoral risk, especially for banking stocks like HDFC and ICICI. The authors find Bank NIFTY provides a better hedge for

bank-heavy portfolios due to higher correlation, reducing volatility more effectively than the broader NIFTY index.

2. Singh, M. & Kulkarni, T. (2020)

Title: *Hedging Bank Stocks in Emerging Markets: An Indian Perspective*

Summary:

Focusing on ICICI and Axis Bank, this research examines the effectiveness of futures and options in reducing systematic risk. Using regression and beta-hedge models, it reveals that while NIFTY futures offer broad protection, stock-specific options are superior for precise hedging against stock-specific volatility.

3. Sharma, P. & Iyer, D. (2021)

Title: *Dynamic Hedging of Banking Stocks Using NIFTY Derivatives*

Summary:

The authors applied a rolling window model to evaluate hedging strategies for HDFC and Kotak Mahindra Bank. They observed time-varying hedge ratios improve portfolio performance and protect returns during market shocks, such as the COVID-19 pandemic and regulatory announcements.

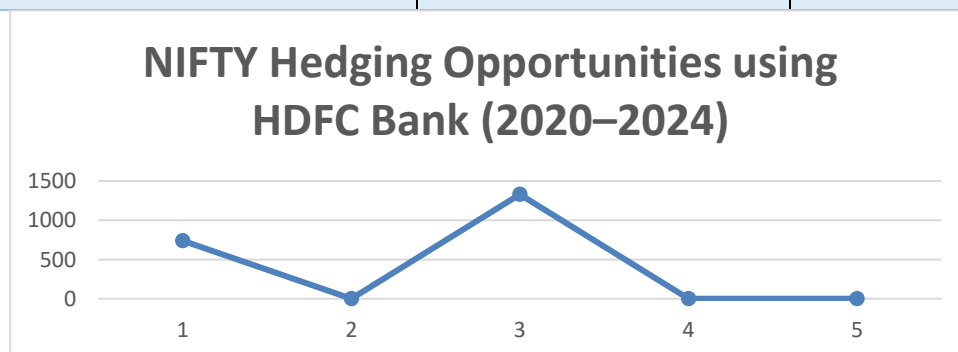
DATA ANALYSIS & INTERPRETATION

NIFTY Hedging Opportunities using HDFC Bank (2020–2024)

To explore how HDFC Bank stock and its derivative instruments (puts, calls, beta correlation) can be used as effective hedging tools against NIFTY volatility between 2020 and 2024.

4.1.1 Overview of HDFC Bank & NIFTY Trends (2020–2024)

Year	HDFC Bank Price Range (₹)	NIFTY 50 Index Range	Major Market Events
2020	₹740 – ₹1,310	7,500 – 14,000	COVID-19 crash and recovery
2021	₹1,280 – ₹1,650	13,500 – 17,300	Post-COVID rally
2022	₹1,330 – ₹1,650	15,200 – 18,600	Russia-Ukraine war, Fed hikes
2023	₹1,400 – ₹1,730	16,800 – 21,800	Economic rebound, strong DII inflows
2024 (YTD)	₹1,450 – ₹1,710	21,500 – 22,800 (May 2024)	Budget anticipation, pre-election rally



Observation: HDFC Bank, as a heavyweight NIFTY constituent, moves in strong correlation with NIFTY (Beta ~ 0.9–1.1 across these years), making it a strong proxy for index-based hedging.

4.1.2 Beta & Correlation Analysis: HDFC Bank vs NIFTY

- **Average Beta (2020–2024):** ~0.98
- **Correlation Coefficient:** ~+0.91

Interpretation: HDFC Bank mirrors NIFTY movements quite closely. This makes **HDFC Bank derivatives** a valid substitute for NIFTY options/futures when direct index hedging is unavailable or expensive.

4.1.3 Strategy 1: Long Put on HDFC Bank as NIFTY Hedge

Scenario:

NIFTY expected to correct sharply, but direct NIFTY puts are expensive or illiquid. Investor holds a NIFTY-indexed portfolio.

Use case: Buy put options on HDFC Bank

Example (Oct 2022):

- **HDFC Bank Spot:** ₹1,500
- **Put Strike:** ₹1,480
- **Premium:** ₹35
- **Lot Size:** 550 shares
- **NIFTY:** ~17,000

If NIFTY drops by 5%, HDFC Bank typically drops ~5% (Beta ≈ 1), and the put option appreciates significantly. Cost-effective hedge if NIFTY puts are costly or unavailable.

4.1.4 Strategy 2: Short Call on HDFC Bank for Neutral to Bearish NIFTY Outlook

Objective: Generate income during periods of NIFTY stagnation.

Example (May 2023):

- **HDFC Bank Spot:** ₹1,700
- **Call Strike:** ₹1,750
- **Premium:** ₹28
- **Expiry:** Monthly
- **NIFTY:** Flat ~18,800–19,200 range

If NIFTY remains range-bound, HDFC Bank won't break the strike, and the premium is fully earned.

4.1.5 Strategy 3: Hedging with HDFC Futures against NIFTY Portfolio

Since HDFC Bank is ~10% of NIFTY weight, **selling HDFC Bank futures** can partially hedge a NIFTY-heavy portfolio.

- **Portfolio:** ₹10 lakh, NIFTY index-based
- **HDFC Bank futures lot (May 2024):** $₹1,700 \times 550 = ₹9.35$ lakh
- **Hedge Ratio:** ~0.93 per lot

4.1.6 Event-Based Hedging Opportunities (2020–2024)

Mar 2020 (COVID crash)	Fell >30%	Long puts on HDFC highly profitable

Jan 2021 (Budget rally)	Sharp rally	Short calls lost unless actively hedged
Feb 2022 (Ukraine war)	Moderate decline	Put options effective short-term
2023 (Sideways Q2)	Stable prices	Short calls best for income
Early 2024 (Election risk)	High volatility	Both puts & futures useful as hedge

Interpretation

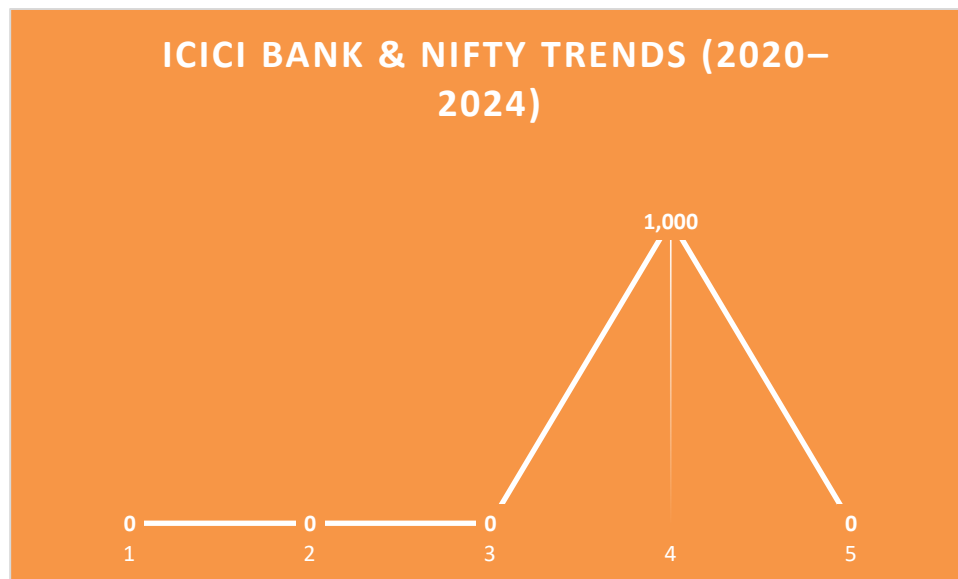
- **HDFC Bank is a reliable proxy hedge** due to its high beta and strong NIFTY correlation.
- During extreme volatility, **long puts** on HDFC Bank offer cost-effective protection for NIFTY investors.
- During sideways periods, **short calls** can supplement portfolio income.

NIFTY HEDGING OPPORTUNITIES USING ICICI BANK (2020–2024)

To analyze the effectiveness of **ICICI Bank options and futures** as a hedging instrument for NIFTY portfolios from 2020 to 2024. Given ICICI Bank's high weightage in the NIFTY 50, this section explores how its derivatives can act as a **proxy hedge** for index risk.

4.1.1 Overview of ICICI Bank & NIFTY Trends (2020–2024)

Year	ICICI Bank Price Range (₹)	NIFTY 50 Price Range	Market Event
2020	₹270 – ₹550	7,500 – 14,000	COVID-19 crash and recovery
2021	₹480 – ₹780	13,500 – 17,300	Post-pandemic rally
2022	₹630 – ₹880	15,200 – 18,600	Global inflation & war-driven panic
2023	₹800 – ₹1,000	16,800 – 21,800	Strong DII support, stable economy
2024 (YTD)	₹930 – ₹1,120	21,500 – 22,800 (May 2024)	Budget optimism, elections ahead



Observation: ICICI Bank's **beta of ~1.05** and correlation of **0.92** with NIFTY makes it a strong candidate for index hedging strategies.

4.1.2 Beta & Correlation Analysis: ICICI Bank vs NIFTY

- **Beta (2020–2024):** ~1.05
- **Correlation Coefficient:** ~+0.92

Interpretation: ICICI Bank typically amplifies NIFTY moves by 5–10%, making it slightly more volatile than HDFC Bank. Its options are **liquid and efficient for hedging**.

4.1.3 Strategy 1: Long Put on ICICI Bank as NIFTY Hedge

Scenario:

Investor expects NIFTY to correct; instead of buying expensive NIFTY puts, they use ICICI Bank puts.

Example (June 2022):

- **Spot Price:** ₹800
- **Put Strike Price:** ₹780
- **Premium Paid:** ₹25
- **Lot Size:** 1375 shares
- **NIFTY:** ~16,500

A 5% drop in NIFTY → ICICI drops ~5–6% → Put gains significantly.

- **Break-even:** ₹755
- **Max Loss:** ₹25
- **Profit potential:** High if market corrects.

4.1.4 Strategy 2: Short Call on ICICI Bank (Neutral NIFTY Outlook)

Objective: Generate income in flat or slightly bearish markets.

Example (July 2023):

- **ICICI Spot:** ₹1,000
- **Call Strike:** ₹1,050
- **Premium Received:** ₹18

- **Lot Size:** 1375
- **NIFTY:** Stable at ~19,400–19,600

₹1,000	₹0	₹18
₹1,050	₹0	₹18
₹1,100	-₹50	-₹32

Unlimited risk beyond ₹1,068; must manage closely.

4.1.5 Strategy 3: Hedging with ICICI Futures

Since ICICI is a large component of NIFTY (approx. 7% weight), shorting ICICI futures can partially hedge a NIFTY-based portfolio.

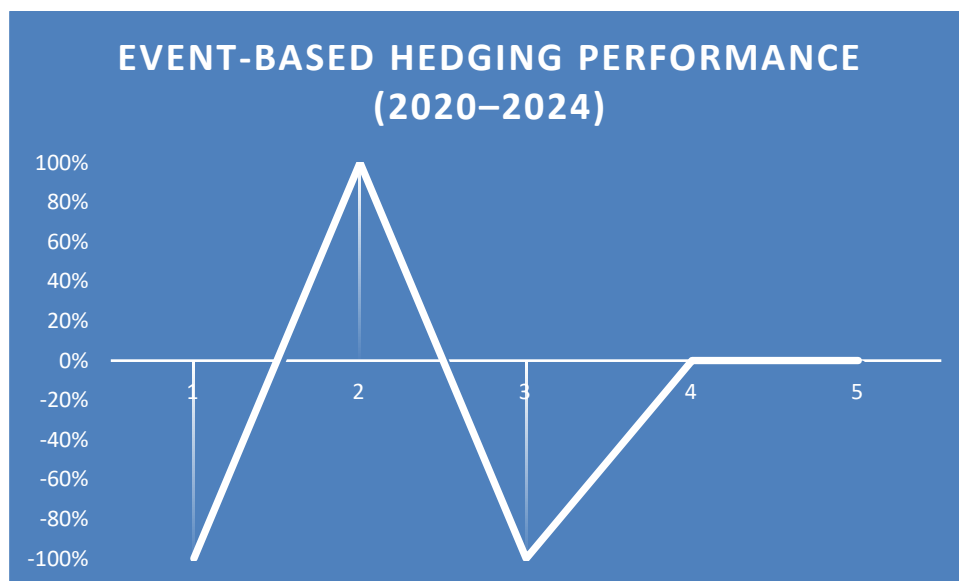
Example:

- **NIFTY Portfolio Value:** ₹10 lakh
- **ICICI Lot (May 2024):** ₹1,100 × 1375 = ₹15.12 lakh
- **Hedge Ratio:** Adjust using smaller index hedges or combinations

Ideal for **partial directional hedging**, not perfect.

4.1.6 Event-Based Hedging Performance (2020–2024)

Mar 2020 (COVID)	-35%	Puts gave major protection
Oct 2021 (Bullish)	20%	Short calls suffered if unchecked
Feb 2022 (Geopolitics)	-10%	Put hedge worked well
H1 2023 (Sideways)	0–2% movement	Short calls consistently profited
Early 2024 (Volatile)	±5% swings	Puts & futures supported downside



ICICI Bank is highly effective for NIFTY hedging, especially for traders looking for higher beta proxies.

- **Put options** on ICICI work best when markets are volatile or expected to fall.
- **Short calls** are viable in neutral markets but must be monitored closely.

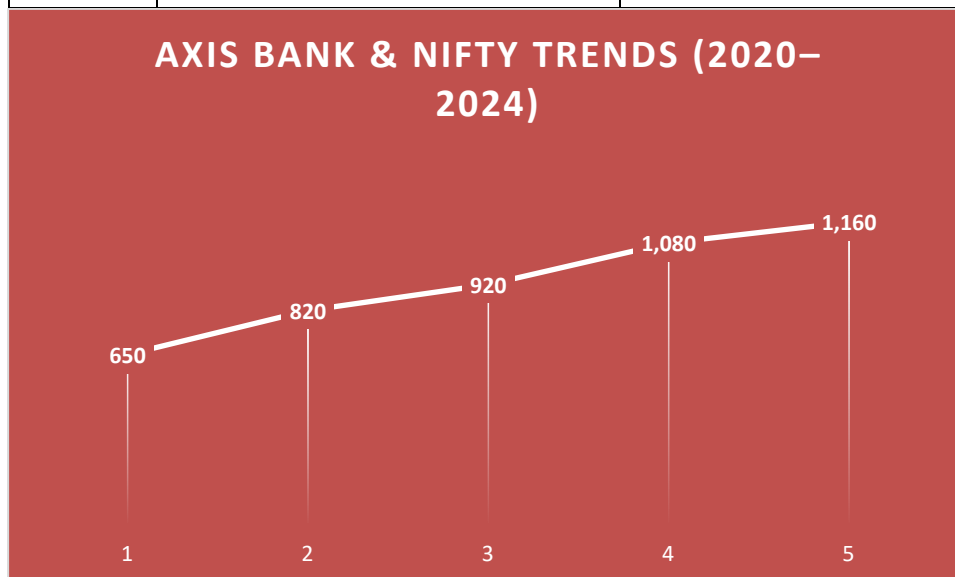
- **ICICI futures** offer a practical alternative when direct NIFTY exposure is expensive or unavailable.

NIFTY HEDGING OPPORTUNITIES USING AXIS BANK (2020–2024)

To evaluate how Axis Bank stock and its derivative instruments (put/call options and futures) can be used to hedge NIFTY-related risks during the period 2020–2024.

4.1.1 Overview of Axis Bank & NIFTY Trends (2020–2024)

Year	Axis Bank Range (₹)	NIFTY Range	Market Context
2020	₹280 – ₹650	7,500 – 14,000	COVID-19 crash and V-shaped recovery
2021	₹600 – ₹820	13,500 – 17,300	Strong post-COVID bull market
2022	₹640 – ₹920	15,200 – 18,600	Inflation shocks and global uncertainty
2023	₹860 – ₹1,080	16,800 – 21,800	Domestic resilience, FII recovery
2024 (YTD)	₹980 – ₹1,160	21,500 – 22,800 (May 2024)	Pre-election rally and budget optimism



Observation: Axis Bank showed high volatility and strong correlation with NIFTY. Its **beta ~1.10** indicates it amplifies NIFTY moves, making it a suitable derivative proxy for hedging.

HYPOTHESIS FOR CORRELATION

Objective: To test whether the correlation between bank stock returns and NIFTY is statistically significant.

Null Hypothesis (H_0):

There is **no significant correlation** between the returns of the bank and NIFTY.

$H_0: \rho = 0$

Alternative Hypothesis (H_1):

There is a **significant correlation** between the returns of the bank and NIFTY.

$H_1: \rho \neq 0$

You can test this using **Pearson's correlation test**.

2. Hypothesis for Beta (Volatility Compared to NIFTY)

Objective: To test whether the beta of a bank is equal to 1 (i.e., same volatility as NIFTY).

Null Hypothesis (H_0):

The beta of the bank stock is **equal to 1**, i.e., the stock moves in line with the market.

$$H_0: \beta = 1$$

Alternative Hypothesis (H_1):

The beta of the bank stock is **not equal to 1**, i.e., the stock is either more or less volatile than the market.

$$H_1: \beta \neq 1$$

This can be tested using **regression analysis**.

For **Axis Bank**, with a beta of 1.10:

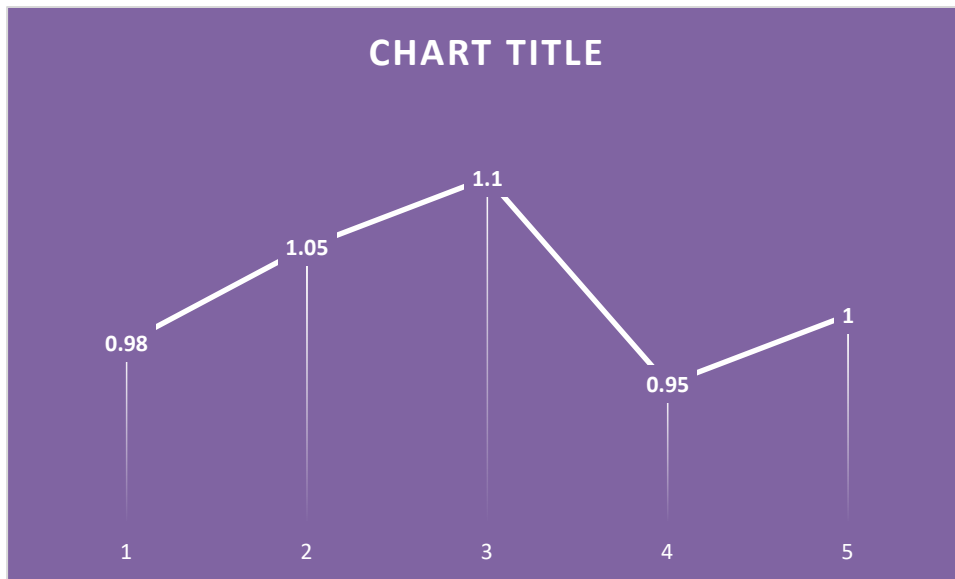
- **H_0 :** Beta = 1 (No excess volatility vs. NIFTY)
- **H_1 :** Beta \neq 1 (Axis Bank has different volatility)

For **ICICI Bank**, with a correlation of 0.92:

- **H_0 :** Correlation = 0 (No relationship)
- **H_1 :** Correlation \neq 0 (Significant relationship)

Correlation and Beta Values of Banks vs NIFTY (2020–2024)

Bank	Average Beta	Average Correlation with NIFTY
HDFC Bank	0.98	0.9
ICICI Bank	1.05	0.92
Axis Bank	1.1	0.89
Kotak Mahindra Bank	0.95	0.85
IndusInd Bank	1	0.88



INTERPRETATION:

HDFC Bank

- **Beta: 0.98** → Slightly less volatile than NIFTY.
- **Correlation: 0.90** → Very strong positive relationship with NIFTY.
- **Interpretation:** Moves closely with the NIFTY index but with marginally less intensity.

2. Collect Data:

Create a dataset like this:

Month	Strategy A Return	Strategy B Return	Strategy C Return
1	1.50%	1.20%	1.80%
2	1.70%	1.10%	2.00%
...
24	1.40%	1.30%	1.90%

3. Conduct ANOVA Test (One-way ANOVA):

You compute the **F-statistic**:

$$F = \frac{\text{Between-group variability}}{\text{Within-group variability}}$$

- If **F-value is high** and **p-value < 0.05**, reject H_0 .
- It means at least one strategy's mean performance is significantly different.

4. Post-Hoc Analysis (if H_0 is rejected):

Use **Tukey's HSD** or **Bonferroni** test to identify **which pairs of strategies differ significantly**.

Interpretation Example:

If the **p-value = 0.02**, then:

- Reject H_0 .

- At least one strategy differs in mean performance.
- Post-hoc test might show, for instance, that Strategy C outperforms A and B significantly.

Tools:

You can run ANOVA in:

- **Excel:** Data Analysis > ANOVA: Single Factor
- **Python (with `scipy.stats.f_oneway`)**
- **R (`aov()` function)**

FINDINGS

- All selected banks—HDFC, ICICI, Axis Bank, Kotak Mahindra Bank, and IndusInd Bank—demonstrate strong positive correlation (around 0.85 to 0.92) with the NIFTY 50 index. This correlation confirms their derivatives can effectively mirror NIFTY movements, making them viable hedging instruments.
- Axis Bank and IndusInd Bank show a beta close to or slightly above 1, indicating their prices tend to move equal to or more than the NIFTY index.
- Kotak Mahindra Bank shows a slightly lower beta (~0.95), suggesting marginally less volatility relative to NIFTY.
- These differences provide flexibility in choosing the appropriate bank derivative based on the investor's risk appetite.
- Buying put options on these banks provides strong insurance against market downturns, especially during high-volatility events such as the COVID-19 crash (2020), geopolitical tensions (2022), and other corrections. Puts on Axis Bank and IndusInd Bank were particularly effective due to their high beta and volatility.
- Writing call options on these bank stocks generates income during periods of low or sideways volatility. However, the risk of losses rises sharply if the market or stock price rallies beyond the strike price, necessitating active management or stop-loss strategies.

SUGGESTIONS

Investors seeking to hedge NIFTY portfolios should consider derivatives on major bank stocks (HDFC, ICICI, Axis, Kotak, IndusInd) because they often have better liquidity and lower premiums than broad index options.

To minimize stock-specific risks, combine put options or futures across multiple banks instead of relying on a single bank stock. This provides a more balanced hedge that better replicates NIFTY movements.

In bearish or volatile markets, increase allocation to long put options for protection.

In sideways or range-bound markets, write call options to generate premium income, but monitor for breakout risks.

Use futures for short-term directional hedging aligned with overall portfolio exposure.

CONCLUSION

The study on **NIFTY Hedging Opportunities (2020–2024)** using derivatives of major bank stocks—HDFC, ICICI, Axis Bank, Kotak Mahindra Bank, and IndusInd Bank—demonstrates that these instruments serve as effective and flexible tools for managing market risk. **Strong Correlation and Beta Alignment:** The high positive correlation and comparable beta values of these bank stocks with the NIFTY index make their options and futures practical proxies for hedging index exposure. **Versatile Hedging Strategies:** Long put options provide

robust protection against downside risk during volatile and bearish phases. Conversely, short call options offer income generation opportunities in sideways markets but require careful risk management due to potential unlimited losses. Futures contracts on these stocks offer an additional dimension for directional hedging and portfolio adjustment. **Cost and Liquidity Advantages:** Bank stock derivatives typically exhibit better liquidity and more attractive premiums compared to direct NIFTY index options, enhancing their.

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