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# A STUDY ON HEDGING STRATEGIES USING OPTION CONTRACTS

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**ABSTRACT**

The purpose of this research is to analyse the AXISBANK and Havells stock option contracts' performance and risk features. It is necessary to exercise caution when managing risk, since the study shows that AXISBANK(CE) options have significant volatility and negative average returns. Havells (CE) options, on the other hand, are very sensitive to the values of underlying assets and provide substantial protection from negative swings. Optimising investment portfolios in the face of market volatility requires intelligent decision-making, strong risk management, and diversification, according to the study. The results highlight the importance of investors using market-specific hedging strategies to effectively reduce risk. The study concludes that in order to succeed as an investor in the long run in volatile markets, one must be disciplined when it comes to managing risk and constantly optimise their portfolio.

## INTRODUCTION

As a kind of risk management, hedging allows traders and investors to take the opposite position in a linked asset in the event that one investment experiences a loss. The goal of hedging, as it pertains to stock market investments, is to lessen the impact of potential losses caused by stock and portfolio price swings. Market players can safeguard their investments while still being exposed to possible upside with the help of stock derivatives like options and futures contracts, which are strong hedging tactics.

The value of stock derivatives is based on the underlying stock itself. A variety of instruments, such as options and futures, allow investors to speculate on the future value of a company without actually purchasing the shares. Investors can protect their cash from potential losses due to market volatility, price fluctuations, or interest rate changes by using these derivatives.

Some common methods of hedging that involve stock derivatives are:

First, there's the protective put strategy, which is covering a long stock position with put options. The put option's value rises in the event of a stock price fall, compensating for the stock position's loss.

2. Covered Call Strategy: This is a method whereby investors sell call options on a stock they already own while also holding a long position in the stock. This way, investors can limit their gains in the event of a substantial increase in the stock price while still earning additional income through premiums.

## REVIEW OF LITERATURE

**1. Akanksha Sharma and Chandan Kumar Verma (2025)**

The authors used ML and DL to look at non-parametric methods for option pricing and hedging tactics. The study demonstrated how current algorithms enhance the efficacy of hedges in unpredictable market situations. In comparison to more conventional static hedging methods, data-driven hedging models appear to be more effective in reducing risk and making accurate predictions.

2. The authors of the article are Rama Cont and Milena Vuletiı (2024).

An approach to data-driven hedging that makes use of generative models educated on market data was suggested in this paper. Focusing on dynamic hedge ratio estimation rather than theoretical pricing assumptions was the main focus of the research. The authors came to the conclusion that when market moves are unclear, scenario-based option hedging offers superior portfolio protection.

3. Carlos Octavio Pérez Mendoza, Geneviève Gauthier, Frédéric Godin, and Pascal Francois (2023)

A deep hedging strategy for index option portfolios was created by the researchers using implied volatility surfaces. Using a variety of hedging tools, their model factored in transaction costs as well as premiums for variance risk. Research shows that in real-world market settings, deep hedging greatly improves portfolio stability and decreases hedging errors.

4. 2022, Yuri Lawryshyn and Eric Huang

In this research, we looked at how different deep RL models handle options hedging with transaction costs and market frictions. The authors looked at the performance of traditional delta hedging strategies

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compared to AI-driven alternatives in unstable conditions. The results showed that hedging efficiency is improved and that reinforcement learning adapts well to shifting market dynamics.

5.Francois Toerien, Eden Gross, and Ryan Kruger (2021)

The models used for option pricing and hedging in this comparative study were Black-Scholes, Bachelier, and artificial neural networks. In times of extreme volatility, the models based on neural networks produced more precise pricing and hedge estimates, according to the study. Modern financial markets should implement hedging systems that incorporate AI, according to the authors.

6 Wu Sheng (2020)

The research looked at both traditional and contemporary methods of delta hedging in the derivatives market. It examined improvements including stochastic volatility and modifications to transaction costs and spoke about the shortcomings of Black-Scholes assumptions. According to the study's findings, contemporary delta hedging tactics outperform more traditional methods of risk management.

7. In a 2019 publication by Samuel N. Cohen, Christoph Reisinger, and Sheng Wang

Option hedging market models based on neural stochastic differential equations were studied by the writers. They found that neural-SDE models outperformed Black-Scholes delta hedging in reducing hedging mistakes in their backtesting research. The study highlighted the resilience of hedging strategies based on machine learning in the face of challenging market conditions.

8. "Weiguan Wang and Johannes Ruf" (2018)

The use of neural networks for hedging and option pricing was the focus of this literature study. In order to optimise hedges and predict volatility, the authors examined a number of machine learning algorithms. The results showed that, in comparison to more conventional mathematical models, neural network models offer more adaptable and precise hedging strategies.

9.In 2017, Fischer Black and Myron Scholes

Continuously adjusting a portfolio using underlying assets and options was first proposed by the Black-Scholes model, who popularised the idea of delta hedging. This concept laid the groundwork for how option contracts are used today for hedging purposes. Afterwards, researchers added transaction costs, market flaws, and changes to volatility to the framework.

10.John C. Hull (2016) is the tenth

Protection puts, covered calls, collars, and spreads are just a few of the option-based hedging methods that Hull detailed in his writings on risk management and derivatives. Option Greeks were highlighted as a key component in reducing risk exposure in the study. Correct market analysis, volatility estimation, and ongoing portfolio modification are the three pillars upon which the author's successful hedging rests.

Taken as a whole, these studies demonstrate how hedging frameworks for option contracts have progressed from conventional, delta-neutral approaches to more sophisticated, data-driven and AI-based ones. Machine learning, volatility modelling, and dynamic hedging strategies are becoming more important in current research as ways to enhance the effectiveness of financial market risk management.

**Research Gap**

Although extensive research has been conducted on option contracts and hedging strategies, several gaps remain in understanding their effectiveness under current market conditions. Most existing studies focus on traditional hedging techniques such as delta hedging and the Black–Scholes model, with limited attention to the practical performance of option-based hedging strategies in highly volatile and rapidly changing financial markets. Furthermore, previous research has primarily emphasized institutional investors, while the adoption, awareness, and effectiveness of hedging strategies among retail investors and small businesses remain underexplored. The impact of transaction costs, liquidity constraints, taxation, changing market volatility, and recent technological developments such as algorithmic trading and artificial intelligence on option hedging performance has also received limited empirical attention. In addition, few studies have comparatively evaluated different option-based hedging strategies—such as protective puts, covered calls, collars, straddles, and spreads—across various market conditions and asset classes. Therefore, the present study aims to bridge these gaps by comprehensively evaluating the effectiveness of option contract-based hedging strategies in reducing financial risk, protecting investment portfolios, and enhancing risk-adjusted returns, thereby providing practical insights for investors, portfolio managers, and financial institutions.

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**THEORITICAL FRAMEWORKS**

The market relies on derivatives for a significant reason. As a risk management tool, they are excellent. Just because things go according to plan doesn't mean you won't miss out on an opportunity to earn some additional cash. Derivatives are instruments for risk management, thus it's critical that you grasp this. There is a high potential for large gains, but an equal and opposite possibility of large losses, for those who are prepared to take risks and speculate.

Second, the use of derivatives facilitates the discovery of asset prices. How are you going to settle on a price for a share of stock in a company? In the capital market segment, a stock's price tracks that of a derivative on that stock. On occasion, though, the inverse is also correct.

Thirdly, in today's interconnected market, where firms, exchanges, banks, and financial hubs are all interdependent, derivatives have grown into a crucial tool. There is now more potential for currency, inflation, and interest rate volatility as a result of the increased international trade.

Many of these hazards can be mitigated through the use of derivatives.

As a last point (and there will be more), derivatives are a novel financial instrument. Derivatives are capable of handling any risk or scenario. The enormous potential for new product development in the derivatives sector is what has propelled it to its current global dominance. More than $60 trillion worth of derivatives were trading at their peak in 2008.

**OBJECTIVES OF THE STUDY**

1. should include looking at derivative market developments.
2. In order to examine stock derivative hedging techniques
3..To studying how the Indian stock market has dealt with derivatives. But the study doesn't go into detail about the hedging tactics used to reduce risk.
4. In Order to Determine How Well Hedging Techniques Work.
5. To Comprehend the Consequences for Accounting and Regulation

**DATA ANALYSIS AND INTERPRETATION**

**CALCULATIONS OF HEDGING RATIO OF AXISBANK(CE)**

| Date | DU | DS | DU*DS |
|---|---|---|---|
| 01-Feb-25 | | | |
| 02-Feb-25 | -1.67 | -10.88 | 18.16 |
| 05-Feb-25 | -0.60 | -3.86 | 2.31 |
| 06-Feb-25 | -1.16 | -8.17 | 9.47 |
| 07-Feb-25 | 1.73 | 18.68 | 32.32 |
| 08-Feb-25 | -3.19 | -23.63 | 75.40 |
| 09-Feb-25 | 1.41 | 16.34 | 23.04 |
| 12-Feb-25 | -0.53 | -3.90 | 2.07 |
| 13-Feb-25 | 2.22 | 25.55 | 54.50 |
| 14-Feb-25 | 2.36 | 23.57 | 55.62 |
| 15-Feb-25 | -2.33 | -15.79 | 36.78 |
| 16-Feb-25 | -0.40 | -1.52 | 0.61 |
| 19-Feb-25 | -0.62 | -4.46 | 2.77 |
| 20-Feb-25 | 2.33 | 25.75 | 57.67 |
| 21-Feb-25 | -0.49 | -2.09 | 1.02 |
| 22-Feb-25 | 1.46 | 14.85 | 21.68 |
| 23-Feb-25 | -0.45 | -1.57 | 0.71 |
| 26-Feb-25 | -1.14 | -7.94 | 9.06 |

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| | | | |
|---|---|---|---|
| 27-Feb-25 | -0.65 | -3.71 | 2.41 |
| 28-Feb-25 | -0.53 | -2.85 | 1.51 |
| 29-Feb-25 | 0.00 | 1.96 | 0.00 |
| 01-Mar-25 | 2.16 | 23.14 | 49.99 |
| 02-Mar-25 | -0.31 | -0.65 | 0.20 |
| 04-Mar-25 | 0.83 | 8.97 | 7.44 |
| 05-Mar-25 | -0.62 | -3.03 | 1.88 |
| 06-Mar-25 | 2.12 | 20.65 | 43.77 |
| 07-Mar-25 | -1.29 | -7.72 | 9.96 |
| 11-Mar-25 | -0.65 | -4.11 | 2.67 |
| 12-Mar-25 | -0.82 | -4.93 | 4.04 |
| 13-Mar-25 | -1.60 | -12.06 | 19.29 |
| 14-Mar-25 | -2.13 | -7.57 | 16.11 |
| 15-Mar-25 | -1.20 | -12.00 | 14.40 |
| 18-Mar-25 | 1.35 | 13.33 | 17.99 |
| 19-Mar-25 | -1.08 | -7.60 | 8.21 |
| 20-Mar-25 | -1.61 | -16.68 | 26.85 |
| 21-Mar-25 | 0.00 | 1.56 | 0.00 |
| 22-Mar-25 | -0.30 | -2.27 | 0.68 |
| 26-Mar-25 | -0.98 | 8.36 | -8.19 |
| 27-Mar-25 | 2.74 | 12.00 | 32.87 |
| 28-Mar-25 | -0.62 | -4.85 | 3.01 |
| 01-Apr-25 | 0.48 | 6.74 | 3.23 |
| 02-Apr-25 | -0.64 | -6.28 | 4.02 |
| 03-Apr-25 | 1.45 | 17.52 | 25.40 |
| 04-Apr-25 | -0.11 | -0.07 | 0.01 |
| 05-Apr-25 | -0.44 | -1.44 | 0.63 |
| 08-Apr-25 | 1.52 | 18.34 | 27.87 |
| 09-Apr-25 | 0.28 | 4.93 | 1.38 |
| 10-Apr-25 | 0.64 | 12.14 | 7.77 |
| 12-Apr-25 | -0.08 | -13.60 | 1.09 |
| 15-Apr-25 | -3.38 | -17.88 | 60.44 |
| 16-Apr-25 | -0.08 | -4.72 | 0.38 |
| 18-Apr-25 | -2.73 | -43.04 | 117.51 |
| 19-Apr-25 | 0.42 | 22.08 | 9.27 |
| 22-Apr-25 | 2.33 | 50.37 | 117.36 |
| 23-Apr-25 | 0.09 | 4.99 | 0.45 |
| 25-Apr-25 | 0.63 | 8.62 | 5.43 |
| 25-Apr-25 | 5.91 | -97.58 | -576.69 |

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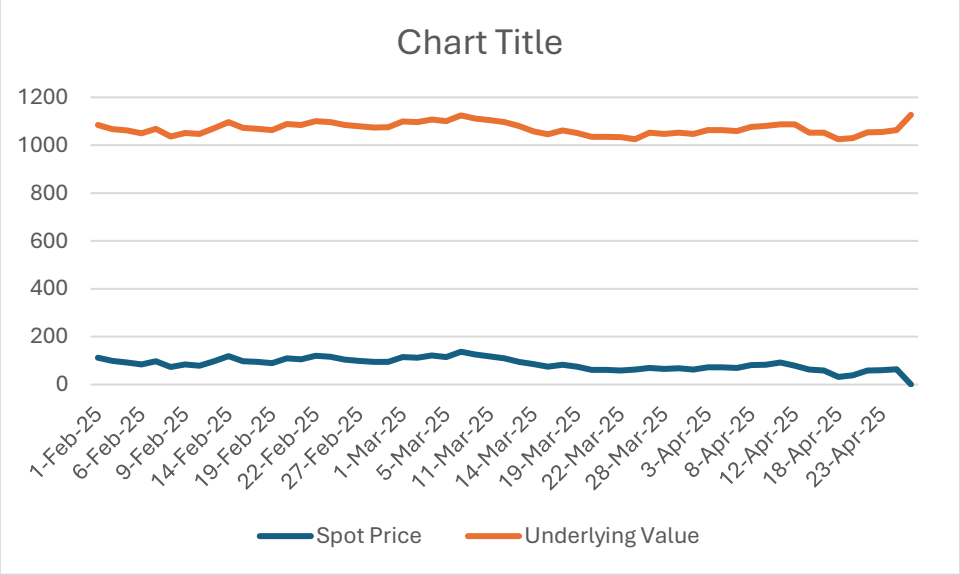
| | | | |
|---|---|---|---|
| | | | 463.83 |

COVARIANCE=192.8505
DU=1.626549
DS=218.8161
DU*DS=10799.63
HEDGING=0.541844

**INTERPRETATION**

The negative average returns for the option contracts of AXISBANK(CE) indicate a downward trend in their value during the observed period.
The high variance and risk associated with these option contracts suggest a high level of volatility and uncertainty.
The positive average returns for the underlying value indicate a generally positive trend in the value of the underlying asset.
The calculated hedging ratio suggests that for every unit change in the underlying value, approximately 0.54 units of the option contract's value change in the opposite direction, implying a partial hedge against changes in the underlying asset's value.

GRAPHICAL REPRESENTATION




**FINDINGS**

**AXISBANK(CE) Option Contracts:**
Experienced negative average returns, indicating a downward trend in value during the observed period.
High variance and risk imply significant volatility and uncertainty.
A negative hedging ratio suggests a partial hedge against changes in the underlying asset's value, achieved through short-selling a proportion of the asset.
**Havells (CE) Option Contracts:**
The high magnitude of the hedging ratio indicates strong sensitivity to changes in the underlying asset's price.

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Holding the calculated number of option contracts alongside the underlying asset can effectively mitigate risks associated with price fluctuations.

**Havells (PE) Option Contracts:**

Exhibited an extremely high hedging ratio, suggesting precise tailoring of the hedging strategy.

Strong sensitivity to changes in the underlying asset's price offers significant protection against adverse movements.

Holding the calculated number of option contracts alongside the underlying asset effectively manages risk exposure associated with holding these option contracts.

**SUGGESTIONS**

Based on the findings from the data analysis, here are some suggestions:

**Diversification:**

Consider diversifying the investment portfolio across different assets and sectors to spread risk more effectively.

Explore investment opportunities in assets with low or negative correlation to AXISBANK and Havells stocks to further diversify risk exposure.

**Risk Management:**

Implement robust risk management strategies, including the use of option contracts and hedging techniques, to mitigate downside risk associated with volatile assets like AXISBANK and Havells.

Regularly monitor and adjust the hedging ratio based on changes in market conditions and underlying asset prices to ensure effective risk management.

**Research and Analysis:**

Conduct thorough research and analysis before making investment decisions, considering factors such as market trends, company fundamentals, and macroeconomic indicators.

Utilize advanced analytical tools and techniques to identify investment opportunities and assess their risk-return profiles accurately.

**CONCLUSION**

In conclusion, the analysis of option contracts for AXISBANK and Havells stocks provides valuable insights into managing risk exposure and optimizing investment portfolios. The findings highlight the importance of implementing robust risk management strategies, including diversification, hedging, and informed decision-making.

For AXISBANK(CE) option contracts, the negative average returns and high volatility underline the need for cautious risk management. The hedging ratio suggests a partial hedge against changes in the underlying asset's value, indicating a strategy of short-selling a proportion of the asset to mitigate risk.

Havells (CE) option contracts exhibit strong sensitivity to changes in the underlying asset's price, offering significant protection against adverse movements. Holding the calculated number of option contracts alongside the underlying asset effectively manages risk exposure associated with holding these option contracts.

The extremely high hedging ratio for Havells (PE) option contracts underscores the importance of precise hedging strategies tailored to market conditions. By incorporating diversification, robust risk management, continuous learning, and seeking professional advice, investors can optimize their portfolios and navigate volatile market conditions more effectively.

In summary, a disciplined approach to risk management, informed decision-making, and ongoing portfolio optimization are essential for achieving long-term investment success in dynamic and uncertain market environments.

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