Nifty Price viz-a-viz Expected Move Quantitative Analysis Report

This report investigates the relationship between the Nifty 50 index's price and the expected move predicted by the Black-Scholes method. The analysis aims to quantify how often the price adheres to the calculated expected move within a specific timeframe (30-60 days, corresponding to the next month's expiry). This information can be valuable for options traders.

Objectives

- Analyse the Nifty 50's price movement relative to the expected move derived from the Black-Scholes method.
- Quantify the percentage of times the price falls within the expected move range calculated 30 to 60 days in advance (next month's expiry).

Methodology

The project is implemented using Python in a Jupyter Notebook.

1. Data Acquisition:

- Nifty 50 Open, High, Low, Close (OHLC) data and India VIX data are retrieved from the NSE India website using the nsefetch() function from the nsepython package.

2. Days to Expiry Calculation:

- The difference between the current date and the expiry date determines the days to expiry.

3. Expected Move Calculation:

- The expected move is calculated using the formula:

  Expected Move = Stock Price x (Implied Volatility / 100) x sqrt(Days to Expiry / 365)

4. Price Limits Determination:

- Upper and lower limits are computed using the formula:
  Upper Limit = Stock Price + Expected Move
  Lower Limit = Stock Price - Expected Move

5. Price Behavior Analysis (Expiry Range):

- This approach examines how often the price stays within the expected move range until the options contract expires.
- The variable ExpiryExitRange captures whether the price crosses either the upper or lower limit during this timeframe.
- The variable ExpiryExitResult records if the price expires within or outside the expected move range.

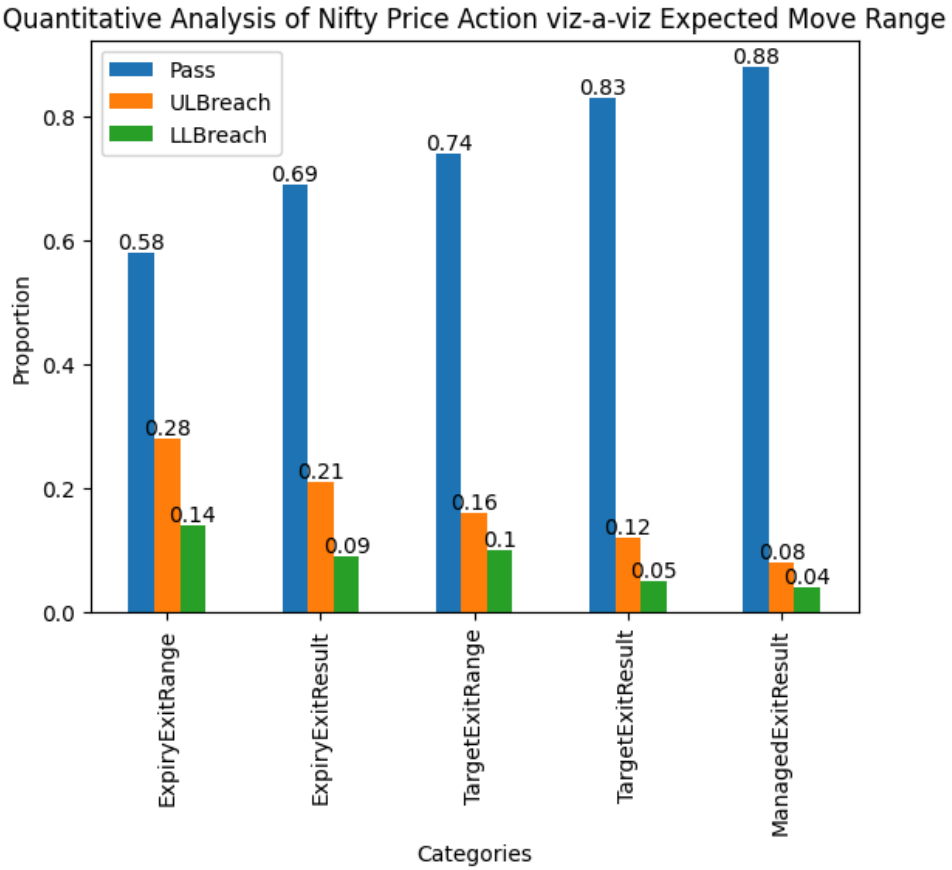
6. Price Behavior Analysis (Target Exit):

- This approach focuses on a predetermined target date to exit the trade before expiry, set at approximately one-third of the days to expiry.
- The rationale behind this approach is that reducing the time frame might theoretically decrease the risk of the price moving outside the expected move range.
- The variable TargetExitRange determines if the price breaches the upper or lower limit before the target date.
- The variable TargetExitResult records whether the price expires within or outside the expected move range at expiry.

7. Managed Exit Analysis:

- The variable ManagedExitResult analyses whether the prices that would have fallen outside the range on the target exit date eventually returned within the range at least once before expiry.
- This information can be valuable for options traders in developing adjustment strategies and risk management decisions.

This project provides a quantitative analysis of the Nifty 50's price movement relative to the Black-Scholes expected move. The results can be used to assess the effectiveness of options trading strategies based on expected move calculations.



Summary of Findings

- The price of Nifty 50 is around 40% more likely to go outside of the expected move range than it ending up actually outside the expected move range for the specific period. This is evident by comparing the ExpiryExitRange and ExpiryExitResult variables.
- There is a 69% chance that the price of the expected move will be inside of the expected move range. This is almost 1 standard deviation of a normal curve, which is unsurprising as the expected move is calculated based on statistical methods itself.
- But when we decide to check for the price action with 1/3rd of the time remaining, the proportion significantly increases.
- While the price stayed within the expected move zone only 74% of the time for the entire duration, 83% of the times it ended up within the zone on the target date of exit.
- There is a 5% more chance of the price moving into the expected move zone between the Target exit date and the Expiry date.

Recommendations

- First and foremost this project is NOT a trade recommendation. Trading in the stock market has a significant risk of losing the capital. The risk is multifold in the Futures and Options derivatives market, since they are highly leveraged. Do your own research before venturing into trading the market.
- Using the expected move for the credit option strategies is a popular practice among traders. If this can be combined with robust risk and capital management practices along with adjustment strategies when the trade is in loss, there is a higher probability of potential for profiting in the markets.
- Iron condors and Short strangles are some of the popular strategies that could be based on the expected move.

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