



Fundamental Understanding of Derivatives - II (Volatility)

Volatility is a statistical measure of the amount of fluctuation in a stock's price within a period of time. A stock with high volatility would have rapid up and down movements in its stock price. A stock with very little movement in its price would constitute low volatility.

There are two main measures of Volatility: Historical Volatility & Implied Volatility. Historical volatility will be discussed in this report whereas implied volatility will be explained in the subsequent report.

Historical Volatility is a statistical measure of the volatility of a futures contract, security, or other instrument over a specified number of past trading days

Historical volatility is the measure of a stock's price movement based on historical prices. It measures how active a stock price typically is over a certain period of time. Usually, historical volatility is measured by taking the daily (close-to-close) percentage price changes in a stock and calculating the average over a given time period. The average is then expressed as an annualized percentage. Historical volatility is often referred to as actual volatility or realized volatility.

Short-term or more active traders tend to use shorter time periods for measuring historical volatility, the most common being 5-day, 10-day, 20-day and 30-day. Intermediate-term and long-term investors tend to use longer time periods, most commonly 60-day, 180-day and 360-day.

Implied Volatility can be defined as the volatility of an instrument as implied by the prices of an option on that instrument, calculated using an options pricing model. An option's value consists of several components – The strike price, expiration date, the current stock price, dividends paid by the stock (if any), the implied volatility of the stock and interest rates.

Instead of substituting a volatility parameter into an option model (e.g. Black-Scholes) to determine an option's fair value, the calculation can be turned round, where the actual current option price is input and the volatility is output. Therefore implied volatility is that level of volatility that will calculate a fair value actually equal to the current trading option price.

This calculation can be very useful when comparing different options on the same underlying & different strike prices. The implied volatility can be regarded as a measure of an option's "expensiveness" in the market, and is used by traders setting up combination strategies, where they have to identify relatively cheap and expensive option contracts.

As there are many options on a stock, with different strike prices and expiration dates, each option can, and typically will, have a different implied volatility. Even within the same expiration, options with different strike prices will have different implied volatilities.