Volatility & Options

February 22, 2024

Contents

1 Volatility, Historical & Implied

1.1 Importance of Volatility

- Remember that Volatility is, along with the price of the underlying and date of expiration, a basic element in Option pricing.
- The more volatile the underlying, the more expensive the Option will be.
- It is often ignored by retail traders, and causes many to underperform.

1.1.1 Historical Volatility (HV)

- The rate of change of the price of the Underlying in the past.
- It is represented as the percentage move of one standard deviation.
- It is calculated based on actual, recent price changes. It is therefore based on known data.

1.1.2 Implied Volatility (IV)

- The rate of change at which the market believes the price of the Underlying will be in the future.
- It is also expressed as the percentage move of one standard deviation.
- IV is more important the HV as it affects the Option's premium.
- Unlike HV, IV is purely based on market expectations, NOT on actual data.
- It is very useful to calculate probabilities of success (which will be discussed in greater detail later).

1.1.3 Implied Volatility Rank (IV Rank)

- As important as IV is however, it does not provide a complete picture into the volatility which affects the stocks price. To complete that picture we turn to the IV Rank, which combines both the IV and HV in a way which allows you to use the past to better predict the future.
- It shows the percentile at which the implied volatility of an option is trading relative to its historical volatility. For example, if IV Rank is 80, it means that, compared to the volatility levels of the past year, 80% of the time options on the Underlying had less implied volatility. This means that the IV of the option is relatively high.
- You can find IV Rank information on several websites or brokerage firms, or you can always calculate it yourself.

$$\text{IV Rank} = 100 * \frac{\text{Current IV} - 52\,\text{week low}}{52\,\text{week high} - 52\,\text{week low}} \tag{1}$$

1.2 How to Trade This

- Since, this firm believes in selling a premium when it is inflated, as a general rule of thumb, we could:
  - Look to sell options when IV Rank is high, ie > 70. Never buy options at this level.
  - Avoid selling when IV Rank is low, i.e. < 20. Maybe consider buying options at this level.
- We do this because IV is mean-reverting, meaning it always returns to its historical mean.