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Option Pricing Model

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Option Pricing Models

What Is An Option Pricing Model
How Do You Use It
What Are The Strengths
Option Greeks
What Are The Weaknesses
Actual Examples

What Is An Option Pricing Model

An option pricing model is a sophisticated mathematical framework that serves as a tool to assign a quantifiable and trackable value to an option.

The model converts the price of an option to a relative value.

How To Use The Option Pricing Model

The model can be used in several ways:

Finding a fair value for an option price using your unique assumptions

Risk Management of the option and your portfolio for changes in underlying stock price, implied volatility, interest rates and dividends

Helps Guide Your Trading Decisions

How To Use The Option Pricing Model

Helps Answer Important Questions:

You can use the model to help determine what the markets imply about the future volatility, interest rates and dividends for the underlying stock

Does the put-call parity hold?

What Are The Strengths

Option Pricing Models can be applied across the board using the same assumptions.

Helps you with option valuation

Creates a framework for trading using the option greeks

Option Greeks

Delta: Measures the directional sensitivity of an option for a dollar move in the underlying stock

Traders can manage directional risk by hedging delta

Option Greeks

Gamma: Measures the rate at which the delta of an option changes in response to changes in the underlying asset's price. In other words, it's the second derivative of the option's value with respect to the underlying asset's price. Gamma gives insight into how quickly an option's delta will change as the underlying asset's price moves.

Option Greeks

Theta: Theta represents the rate of time decay, indicating how much an option's value will change with the passage of one day. It's often expressed as a negative number because it represents the decrease in option value over time.

Option Greeks

RHO: Rho is a measure of how much an option's price will change in response to a change in the risk-free interest rate. It's often expressed as a positive number for call options and a negative number for put options.

Option Greeks

Vega: Vega measures how much an option's price will change in response to a change in implied volatility. It's often expressed as a positive number, indicating that when implied volatility increases, option prices tend to increase, and vice versa.

Option Pricing Model Weakness

Non-Normal Distribution: The Black-Scholes model assumes a normal distribution of price movements, but actual price distributions may deviate from this assumption, especially during periods of high volatility or market crises.

Non-Constant Parameters: Parameters like interest rates and volatility are not constant over time, but option pricing models often assume constant values. Changes in these parameters can affect options pricing, and models that don't account for these changes might provide inaccurate results.

Option Pricing Model Weakness

It is not good for pricing

Binary Events such as earnings

Implied Volatility Skew- Tail risk

Actual Examples

Changing Assumptions and Comparing to Market Prices

Assessing Risk of an Option