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A Fidelity Investments Webinar

Options Pricing

BROKERAGE: OPTIONS

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IMPORTANT INFORMATION

- Any screenshots, charts, or company trading symbols mentioned, are provided for illustrative purposes only and should not be considered an offer to sell, a solicitation of an offer to buy, or a recommendation for the security.

- Options trading entails significant risk and is not appropriate for all investors. Certain complex options strategies carry additional risk. Before trading options, contact Fidelity Investments by calling 800-544-5115 to receive a copy of *Characteristics and Risks of Standardized Options*. Supporting documentation for any claims, if applicable, will be furnished upon request.

- There are additional costs associated with option strategies that call for multiple purchases and sales of options, such as spreads, straddles, and collars, as compared with a single option trade.

- Greeks are mathematical calculations used to determine the effect of various factors on options.

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Intermediate Options Trading Webinar Series

Options Pricing

Understand how options are priced and learn how you can help get better returns.

What You Need To Know About Volatility

Understanding the different volatility types and how to formulate and manage an outlook on implied volatility.

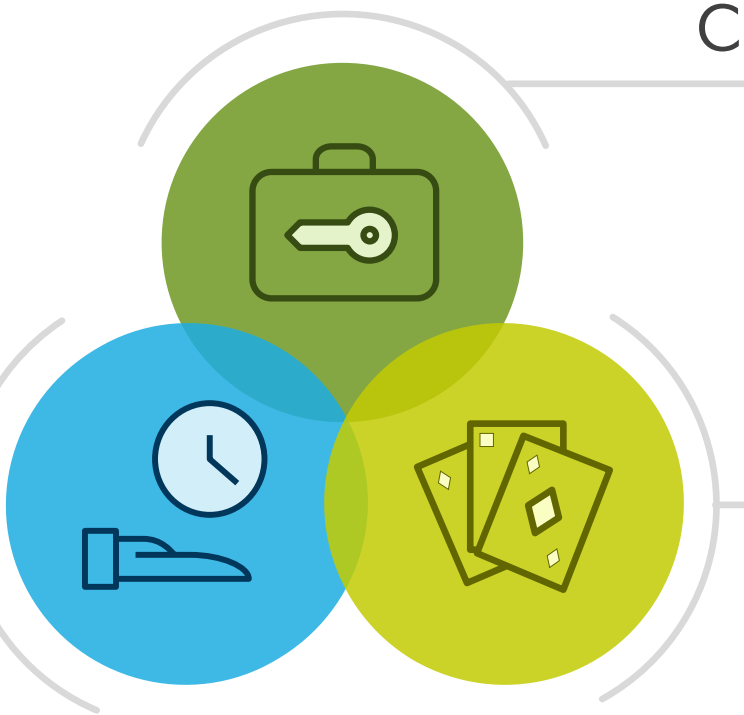
One Leg or Two

Evaluate the pros and cons to more complex options trading strategies (e.g. spreads).

Generating Options Trade Ideas

Get to know the Fidelity suite of resources for options trade idea generation.

Option Price Components



Plan Your Trade

Factors That Affect Price

Agenda

Option Price Components

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Option Pricing Basics

What factors determine an option contract's premium/price?

Option Pricing Factors

- Stock price
- Strike price
- Time to expiration
- Interest rate
- Dividends
- Volatility

Option Pricing Model

Option's Theoretical Price

Option Valuations

What factors affect the supply and demand for options?

Stock owners get nervous

Higher expected move in the security

Buy options for protection or speculation

Higher demand for option contracts

Buying pressure raises IV levels

Higher IV levels

Implied Volatility:

Implied Volatility (IV) can be used as a measure of an option's relative value. Supply and demand for option contracts affects IV.

Result: More expensive premiums

Option Valuations

What factors affect the supply and demand for options?

Rising market improves outlook

Lower expected move in the security

Sell options for income

Lower demand for options

Selling pressure lowers IV levels

Lower IV levels

Result: Less expensive premiums

Implied Volatility:

Implied Volatility (IV) can be used as a measure of an option's relative value. Supply and demand for option contracts affects IV.

Review: Premium Components

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Premium = Intrinsic Value + Extrinsic Value

An option contract that has intrinsic value is "in the money"

An option contract that has no intrinsic value is "out of the money"

Factors That Affect Price

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Factors That Affect Price

Stock Price

Time to Expiration

Volatility

Underlying Stock's Price

Major factor in the price of options

Higher-priced stocks/ETFs will tend to have higher-priced options

- A $1000 stock will typically have higher option prices than a $5 stock

We can measure how movement will affect the option contract's price with the Greeks.*

* Greeks are mathematical calculations used to determine the effect of various factors on options.

Delta

Delta can be used to tell you how much your option contract's price will change based on a dollar move in the underlying. It can also give you share equivalency or an approximation of the probability that the option contract will expire in or out of the money.

Example

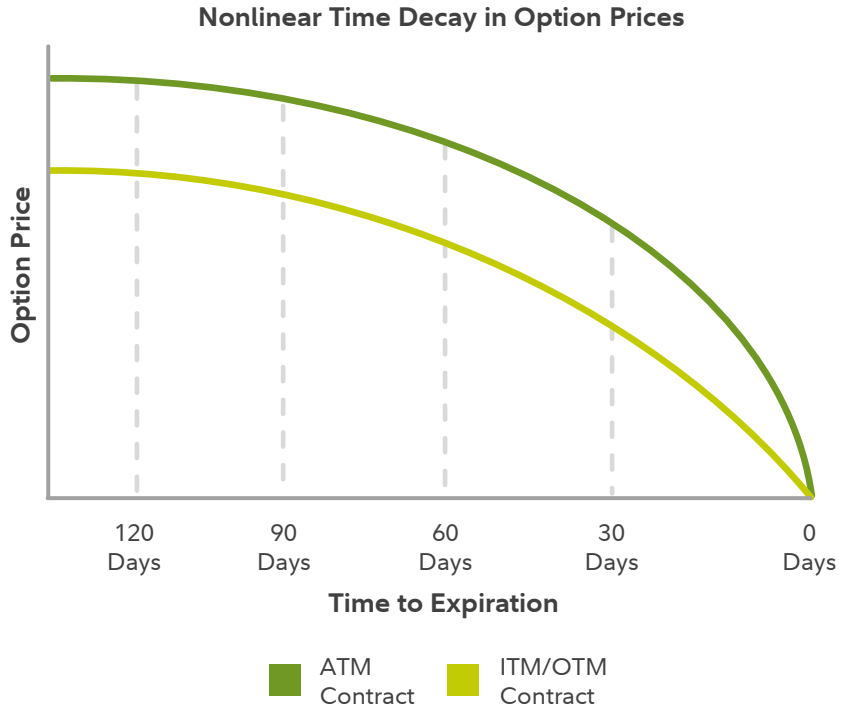
A long call with a 0.50 delta should move approximately $0.50 with a $1 move in the underlying:

This is the equivalent of being long 50 shares of the underlying, and has a 50% chance of being in or out of the money at expiration.

Consider Time Decay

Time decay typically accelerates as expiration comes closer, meaning shorter-term options have the highest time decay.

Strike		Last	Bid	Ask	Theta
Nov 22	CALLS				
85		13.40	13.45	13.65	-0.0198
87.5		11.25	11.10	11.30	-0.0258
90		9.00	8.90	9.05	-0.0336
92.5		6.95	6.85	7.00	-0.0413
95		5.10	5.05	5.20	-0.0473
97.5		3.55	3.55	3.60	-0.0491
100		2.35	2.35	2.38	-0.0468
105		0.85	0.84	0.86	-0.0317
110		0.30	0.29	0.30	-0.0176
115		0.12	0.12	0.13	-0.0099
Apr 17	CALLS				
95.71		8.50	8.45	8.60	-0.0204
96.43		8.15	8.05	8.20	-0.0204
97.14		7.95	7.70	7.85	-0.0205
97.5		7.63	7.50	7.65	-0.0204
97.86		7.45	7.35	7.50	-0.0205
98.57		7.10	7.00	7.15	-0.0205
99.29		6.66	6.65	6.80	-0.0204
100		6.45	6.35	6.45	-0.0204
100.71		6.10	6.05	6.20	-0.0204
101.43		5.70	5.75	5.90	-0.0203



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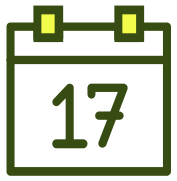
Theta



Theta tells you how much the option contract's value should change based on one day's **passage of time.**

Example

If you have a theta of 0.05, your option's price will lose approximately $0.05 of value for one day's passage of time, all else being equal.

Greeks are not static! $0.05 loss today could be significantly different next day/week/month. At-the-money options experience nonlinear time decay, and decay accelerates around the last 30–45 days of the contract's life.

What Is Volatility?

Volatility measures the relative price fluctuations of a security.

Measure of uncertainty (risk)

- Low volatility > Less movement > Less risk
- High volatility > More movement > More risk

Measured in annualized percentage terms

- 10% volatility on a $100 stock means the one-year expected move is + or (–) $10

No bias for direction

Historical vs. Implied Volatility

Historical Volatility (HV)

- Uses **actual** pricing data over the specified period
- Measures **realized** volatility
- Can be gauged by looking at a price chart
- Based on number of trading days e.g., HV20 includes 20 trading days' worth of data

Implied Volatility (IV)

- Derived from the option contract prices on the given security
- Measures **expected** volatility
- Based on calendar days for a theoretical option

Consider Event Risk

Historical events affect demand—and in turn, impact volatility.

- Earnings reports
- Product releases
- Drug approvals

Each spike in IV on this volatility chart represents an upcoming earnings report.

Image is for illustrative purposes only.

Vega

Vega tells you how much the option contract's value should change based on one-percentage-point change in **Implied Volatility**.

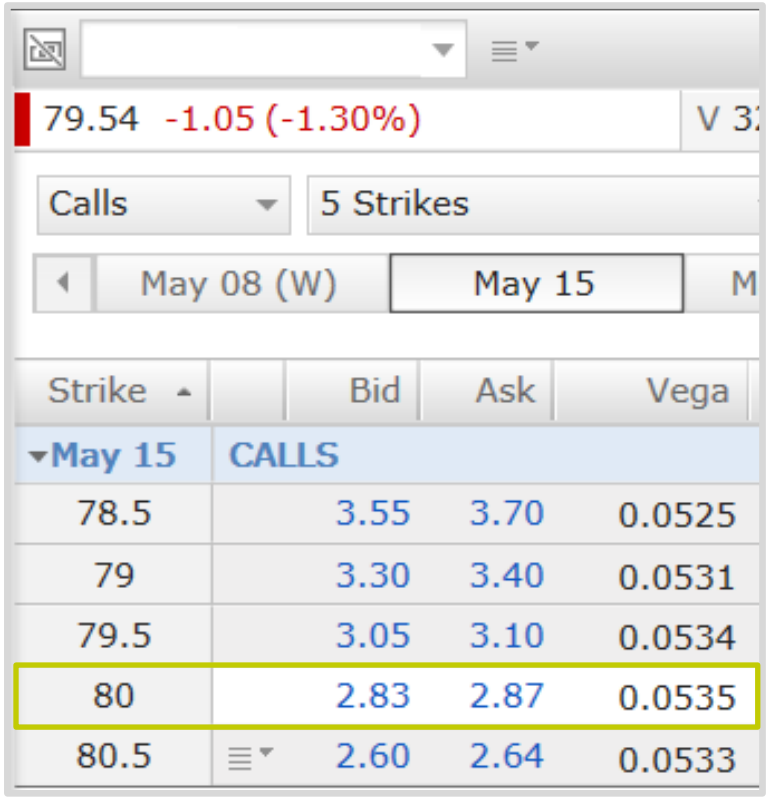
Example

If you have a vega of 0.05, your option's price should gain or lose $0.05 for a one-percentage-point change in Implied Volatility, all else being equal.

Implied Volatility is the "X factor" in options pricing. If there is more demand for an option, IV should increase and, therefore, so will the option's price. If there is less demand for an option, IV should decrease and thus the option's price should decrease as well. Again, remember that a change in IV should directly affect the option's price, but it will also affect all the Greeks.

Measuring Volatility with Vega

Vega = 0.0535
Theoretically, the option will make $5/contract with each 1% move up in IV and lose $5/contract with each 1% move down in IV.



Strike		Bid	Ask	Vega
May 15	CALLS			
78.5		3.55	3.70	0.0525
79		3.30	3.40	0.0531
79.5		3.05	3.10	0.0534
80		2.83	2.87	0.0535
80.5		2.60	2.64	0.0533

Image is for illustrative purposes only.

Example

You are predicting an 8% drop in IV after an earnings announcement.

-8 x 0.0535 x 100 **= –$42.80/contract**

You are expecting the contract price to go **from $2.83 to $2.40** ($2.83 - $0.428) resulting in a **loss of $42.80 from the 8% IV drop,** with everything else remaining constant.

Plan a Trade

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Trade Planning Process

- Reason for Placing the Trade
- Outlook on Price Movement
- Entry Strategy
- Exit Strategy

Reason for Placing the Trade

Is there an event you should consider?

Earnings Report, Product Releases, Drug Approvals
Trading Implied Volatility or Direction

- Implied Volatility Play: Selling or Buying IV Strategies
  Don't forget that the option market is pricing in its expected price movement
- Direction Play: Buying or Selling Strategies
  Don't forget about the IV changes that occur around these events

Technical Events

- Trends can take years to develop versus impacts of time decay
- Support and Resistance
- Breakouts

Fundamentals

- Current business environment
- Individual company metrics

Remember

The reason for placing the trade can help define the exit strategy.

Outlook on Price Movement

Are you bullish, bearish, or neutral?

Bullish

- Positive delta option strategies

Bearish

- Negative delta option strategies

Neutral or no directional bias

- Delta close to zero
- Trade is not based on direction, but on time, IV changes, and/or magnitude of price movement

Remember

There is more than one way to trade direction or volatility outlooks.

Entry Strategy

How do you choose a strike price and an expiration date?

Reason for trade will impact the selected time frame

- **Shorter Term:** High price acceleration, but more time decay
- **Longer Term:** Less time decay, but less price acceleration

Buyer or Seller?

- **Buyer:** Typically, option buyers use further out expirations

  Time works against long option positions

  Further-dated expirations reduce the effects of time decay

  More time for outlook to play out

- **Seller:** Typically, option sellers will look for 30–60 days to expiration

  Attempt to balance premium being received with exposure to accelerated time decay

  Time decay helps short option positions

Remember

Options have a balance of risk and reward.

Keep in mind the amount you are willing to risk relative to the account size. Don't allow trades to get too big.

Exit Strategy

What are your profit and loss targets?

Establish exit strategy before entering trade

Define risk and reward targets

- Dollar or percentage amount
- Technical signal
- Price level

Consider closing when you've reached a specific percentage of max gain

Remember

If your original outlook changes, reassess your exit strategy.

Let Your Outlook Define the Option Strategy

Key takeaways

- Know what you are trying to trade
- Consider your risk/reward balance
- Use volatility analysis to select an option strategy
- Consider the effect of time on the strategy
- Evaluate strategies with option Greeks
- Establish an exit strategy prior to entering a trade
- Reassess if your outlook changes

Visit the Fidelity Learning Center

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Glossary

Delta

Delta is the sensitivity of an options price to the change in the price of the underlying asset.

Theta

Theta measures the effect that the decrease in time has on an option as it approaches expiration. This is also known as time decay. Theta quantifies how much value is lost on the option due to the passing of time.

Vega

Vega is a measure of an option price's sensitivity for a given change in implied volatility. An increase in the implied volatility (i.e., the expected volatility) of an option will increase the value of both call and put options, and falling implied volatility decreases the value of both types of options.

Glossary

Premium

The price a put or call buyer must pay to a put or call seller (writer) for an option contract. Market supply and demand forces determine the premium.

Volatility

A measure of the fluctuation in the market price of the underlying security. Mathematically, volatility is the annualized standard deviation of returns.

Thank You

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