Introduction to Option Trading

Are you ready to enter the integral world of options? First and foremost, gaining a firm understanding of the basics is paramount. Learning options can initially seem a daunting task and at times the "rabbit hole" seems endless. Utilizing options can be complex and there is a significant learning curve in order to take full advantage of them. The following chapters are designed to help you gain a full understanding of the fundamental structure and logic involved in creating and maintaining a successful option portfolio. The thinkorswim Group is committed to helping you through the learning process and supporting our clientele.

Regards,

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Calls and Puts

It is imperative to understand that when buying calls or puts, the potential maximum loss is limited to the amount paid for each contract. When selling calls or puts, the potential maximum loss is unlimited (Short puts really have risk limited to their strike price, minus the premium collected, but are still considered unlimited for all intents and purposes.). Therefore, when you buy an option, you are limiting your risk by transferring it to whoever sold the option. When you sell an option short, you are accepting the risk from whoever bought the option. Options can offer a great deal of leverage, meaning you can assume the risk/reward exposure of a large position in stock, for a relatively small amount of money.

You must realize that there are always trade-offs in options. You must isolate your speculation; that is, precisely pinpoint what you think is going to happen to a stock, and when it is going to happen. You must balance potential risk with potential reward. Always keep in mind that in option trading, you never get anything for free: you either take on risk for premium, or pay someone else to carry your risk.

Buying Calls

Buying a call is perhaps the most common and straightforward option position. It is a strategy that is used if you think a stock's price will rise, and can be seen as a substitute for buying stock. Buying a call offers leverage and limited risk. It costs less to buy an option than it does to buy the underlying stock, and is generally considered less risky than a position in stock, due to options' inherent lower capital requirements. But you have to be confident that the stock price will rise sufficiently to offset the premium and commission you paid, before the expiration date of the option. Options expire; stocks do not. You can "sit" on a stock and hope that it will eventually rise in price. You can't do that with a call option. If the stock price doesn't rise enough by a certain date, the call option will expire worthless or at a lower price than you originally paid. So, it's not enough to be bullish on a stock in order to justify buying a call.

There are trade-offs between potential risk, the probability of profit, and the potential profit. For example, an option's value is continuously whittled down by the passage of time (time decay). There is a constant battle between the erosion of your option's value, waiting for a favorable move in the stock price, and/or an increase in its implied volatility, which can increase the value of the option. Therefore, you need to consider the timing and the magnitude of the anticipated

move in the stock's price. Each one of these variables constitutes a point of speculation that you are accepting when you trade options.

So, you must decide whether to buy a call with more or fewer days to expiration. An option with fewer days to expiration has a few advantages. First, all other things being equal, it is cheaper than an option with more days to expiration. That means you will have a smaller dollar loss if you speculated erroneously. Second, all other things being equal, if the stock price moves up, the stock will probably exhibit a greater percentage increase in value than an expensive longer-term option. So why ever consider buying an option with more days to expiration (time value)?

Well, options with more days to expiration have their advantages too. First, there is more time for the stock to make a favorable move. At a stable volatility, a stock will have a better chance to make a much greater move up or down, given more time. There will be a greater opportunity for the stock to rise sufficiently and/or recover from price declines, in order for the call to be profitable. You don't want the stock to make its big "up" move the day after your call options expire. Second, an option with more days to expiration will experience less price erosion (decay) as time passes, and a smaller percentage loss if the price of the stock remains unchanged or decreases in value.

Changes in implied volatility affect options with more or fewer days to expiration differently. Calls with more days to expiration are more sensitive to changes in implied volatility than are calls with fewer days to expiration. You have to remember that implied volatility can fluctuate, and can adversely affect your position if it moves against you.

Whether to buy an "in-the-money"- ITM, "at the money"- ATM, or "out-of-the-money"- OTM call is another decision you have to make, because each of them respond differently to changing conditions. An ITM option acts the most like a stock position. The deeper it is ITM, the more it exhibits its underlying stock's price behavior. Deep ITM options are affected less by time and changes in volatility, and more by the stock price moving up and down.

An ATM option has the greatest level of uncertainty. It is the most sensitive to changes in the stock price, volatility and passing time. This can be good or bad, depending on your position.

The owner of an OTM call option begs for a dramatic rise in the price of the stock. If there is a big enough move in the stock, an OTM call can deliver a much higher percentage profit than an ITM or ATM call. And if the stock price falls precipitously, the loss on the OTM call is smaller than on an ATM or ITM call. But remember, a big move in most stocks is statistically less likely than a smaller move; so, if the price increase in the stock isn't dynamic enough, OTM calls will expire worthless.

Selling Calls Short

Selling a call short is virtually the mirror image of buying a call. It's the speculation that the price of the stock will fall, stay the same, or rise slightly. You have to consider the same variables as when buying a call, just reverse your directional sentiment. Remember, a short call has limited profit potential (a finite premium) in exchange for the unlimited risk/losses you will incur with a short call on stock that suddenly skyrockets. When considering selling a call short, you should probably augment it with an option position that still expresses your market opinion but limits the upside risk.

Buying Puts

Buying puts is a strategy that profits from a decline in a stock's price. The only practical difference between buying puts and calls is that you want the stock price to go down if you're long puts, and up if you're long calls. Taking the change in directional sentiment for a long put into account, the decisions about days to expiration, volatility, ITM, ATM, and OTM are all basically the same for a put as they are for a call.

Buying a put is an effective alternative to selling stock short. Short stock can have high margin requirements, and some brokers restrict their customers from shorting stock. Unlike short stock, buying puts is a limited risk strategy. Strictly speaking, the potential profit on a long put is the dollar value of the strike price of the put, minus the premium paid. A buyer's option risk is limited: equal to 100% of the premium paid.

Selling Puts Short

Selling a put short is virtually the mirror image of buying a put. Like the potential profit on a long put, the risk of a short put is the dollar value of the strike price of the put, minus the premium of the put. Because a stock can never have a value less than zero, the potential loss on a short put can be very large, but it is not unlimited. When considering selling a put short, you should probably augment it with an option position that still expresses your market opinion but limits the downside risk.

When trading options, you have to refine your points of speculation to incorporate how much you think the stock may move, how much time it will take for the stock to move, and how implied volatility might change. Novice option traders typically ignore one or more of these factors - a major reason they lose money. Understanding the real trade-offs in options will help explain your option positions' behavior.

The Greeks

Buying an option, whether it's a call or put, is known as buying premium; selling or shorting an option, whether it's a call or put, is known as selling premium. This terminology implies a certain equivalency between calls and puts. Indeed, calls and puts share many characteristics.

Mathematical equations have been developed to help estimate how much an option premium will change as the underlying stock moves and as options approach expiration. These equations are commonly referred to as the "Greeks".

The Greeks of calls and puts are calculated from the price of the stock, the strike price of the option, the estimated volatility of the stock, the time to expiration of the option, the current interest rate, and any dividends payable on the stock before expiration.

Delta

1) The delta of a position is the change in the price of an option relative to a change in the price of the underlying stock, when all other factors are held constant. Delta is the rate of change in option (theoretically), for a one-unit change (one dollar move) in the underlying stock price.

2) The delta of a long call is positive and for a short call is negative. The delta of a long put is negative and for a short put is positive.

3) One delta in any given underlying is equivalent to 1 share of stock in that underlying. Example: a trader is long 1 contract of an option with a .33 delta. The trader has net 33 deltas as 1 contract is equal to 100 shares of stock. Therefore the trader has a net position that currently mimics the risk of owning 33 shares of stock in the underlying.

4) **Experienced traders focus on the aggregate delta of the position.** The aggregate delta can be composed of numerous individual or complex option trades with a net position

expressed as a delta. You can add, subtract, and multiply deltas to calculate the delta of a position of options and stock. The position delta is a way to see the risk/reward characteristics of your position in terms of shares of stock. The thinkorswim software presents position deltas on the MONTIOR TAB. It is CRITICAL for successful risk management a trader have a grasp of the delta risk of their total position.

Example 1: A trader purchases 3 contracts of GOOG call that currently has a delta of .42. This aggregate delta is equal to 126 GOOG deltas or the equivalent risk of owning 126 shares of GOOG.

Example 2: A trader is +2300 GOOG deltas. This position of +2300 GOOG deltas may be a compilation of numerous stock and option trades on GOOG; including long stock (positive delta), short puts (positive delta), long calls (positive delta). All of these trades can be view as an aggregate delta on the thinkorswim MONITOR TAB.

Delta can be viewed as an indicator of a trader's market directional bias. Positive delta is bullish; negative delta is bearish. Therefore, if a trader wants to get long the market (or more bullish), they would to add positive deltas (long delta). If a trader intends to get short the market (or more bearish), they would need to add negative deltas (short delta).

5) Delta is the probability of an option falling in the money on expiration by one penny or more. Example: the delta of an individual option is .18; therefore that strike option has approximately an 18% chance of falling in the money by one penny or more on expiration. Conversely, and option with an 18% chance of falling in the money has an 82% chance of expiring worthless. ***Note:** Delta is NOT mathematically equivalent to the probability of expiring but is commonly referenced as a rough estimate for probability of expiring. Probability of Expiring can be found utilizing the thinkorswim TRADE TAB under INFORMATION LAYOUTS.

Traders Notes: Delta is most often used by experienced traders to view risk and overall dollar exposure to an individual underlying or the entire marketplace. Traders should establish a "comfortable" delta and periodically adjust a position to remain within those parameters. Delta is your RISK in DOLLARS and should be monitored closely.

Example: a trader has a position that exhibits +2900 SPY deltas. This literally means for every dollar move in the SPY the trader will make or lose $2900. A $1 move up in the SPY will yield the trader a $2900 profit while a $1 move down in the SPY will cost the trader $2900 (respectively).

Gamma

Gamma is the Greek that reflects changes in delta. If you look at delta as the "speed" of your option position, gamma is the "acceleration". Gamma is the change in an option's delta for a one-unit change in the underlying stock price. The gamma of long options, calls or puts, is always positive; of short options, always negative. Gamma is highest for the near-term ATM strike, and slopes off toward the ITM and OTM strikes. One good way of interpreting gamma is that long gamma "manufactures" deltas in the direction the stock is moving. That is, positive gamma is why long calls get more positive delta when the stock price rises, and why long puts get more negative delta when the stock price falls. With a small gamma, your position delta probably won't change much. The more gamma in your position, the more your position delta can change radically, and therefore should be monitored closely.

Traders Notes: Gamma is an estimate of how much the delta of an option changes when the price of the stock moves $1.00. The rate of change in an option's delta is its gamma. Where delta relates to direction (positive delta is bullish and negative delta is bearish), gamma relates to speed. The larger the gamma the faster the rate of change in delta. Gamma measures speed of the delta. As a tool, gamma can tell you how "stable" your delta is. A large gamma means that

your delta can start changing dramatically and quickly (speed) for even a small move in the stock price. Gamma accelerates as options move closer to expiration. Gamma can be utilized to estimate future deltas of a trader's net position with changes in the underlying. Example: A trader is holding a position on XYZ (naked short calls) and is -300 deltas with -125 gamma. The delta of the position will be inversely affected to the underlying movement. If the underlying moves up $1 the new delta will be -425 deltas; conversely is the stock moves down $1 the positions delta will reflect -175 deltas. **GAMMA is a strategic and essential component in the management of an option trader's portfolio risk.**

Theta

Theta is the dollar value per day that one unit of gamma generates, either positive or negative. Theta is inevitable. Theta is used to estimate how much an option's extrinsic (time) value is whittled away by the always-constant passage of time. Long calls and puts have negative theta, and all other things being equal, lose money as time passes. Short calls and puts have positive theta, and all other things being equal, make money as time passes. The theta of options is indirectly proportional to gamma. When gamma is big and positive, theta tends to be big and negative. That's the trade-off. A position that has a lot of gamma also has a lot of theta.

Theta is highest for the ATM strike, and slopes off to the ITM and OTM options, responds to the passage of time, and changes in volatility, the same way that gamma does.

Vega

Vega measures the rate of change in an option's price for a one-unit change in volatility. Long calls and puts both have positive vega and, all things being equal, make money when implied volatility rises. Short calls and puts both have negative vega and, all things being equal, make money when implied volatility falls. Implied volatilities move up and down, sometimes in frighteningly large amounts. When markets are sluggish, implied volatilities often drop, combining with theta, to the demise of long option positions.

The more time there is until expiration, the higher the vega is for an option. Vega also depends on where the price of the stock is relative to the option strike price. Just as, gamma, theta, and vega are highest for the ATM options and drop for the OTM and ITM options, ATM options with significant time to expiration are the most sensitive to changes in implied volatility.

Positive vega means that the value of an option position increases when volatility increases, and decreases when volatility decreases. Negative vega means that the value of an option position decreases when volatility increases, and increases when volatility decreases.

Traders Notes: Greeks: What are we as option traders trying to accomplish with the greeks of our option positions? This Advanced level options course is designed to educate option traders to be net short option premium in a defined risk manner without taking significant directional market risk. Specifically, selling options in a defined risk manner in order to achieve option decay in the traders favor without taking the risks associated with selecting a market direction. In the larger depiction of this we are trying to attain a flat or **neutral delta**. This entails taking very little or limited directional risk when initially placing a position. Second, when selling options our positions will reflect this with a net **negative gamma** number. Third, we try at all times to keep a **positive theta**. Positive theta is critical because all other things being equal a positive theta means we are collecting option premium as we move through time. Finally, vega can drift between positive and negative depending upon a traders analysis of current volatility of the overall market.

Verticals

Verticals are the most basic option spread. Buying one call or put and selling another one at a different strike price, but in the same expiration month, hedges one option against the other: when one makes money, the other loses money. The idea is, that in exchange for relatively low risk, you're giving up the possibility of stratospheric gains. Verticals are popular with professionals because of their limited risk nature. In some stocks, option volatility is so high it prohibits buying options outright, whereas verticals typically don't cost a lot. Verticals also offer investors an efficient way to create long or short exposure in a stock.

A *long vertical call spread* is long a lower strike call and short a higher strike call. For example, long 1 XYZ Dec 100 call and short 1 XYZ Dec 105 call. A *short call vertical* is short a lower strike call and long a higher strike call: short 1 XYZ Dec 100 call and long 1 XYZ Dec 105 call.

A *long put vertical* is long a higher strike put and short a lower strike put. For example, long 1 XYZ Dec 100 put and short 1 XYZ Dec 95 put. A *short put vertical* is short a higher strike put and long a lower strike put. For example, short 1 XYZ Dec 100 put and long 1 XYZ Dec 95 put.

Long call verticals and short put verticals are bullish. Short call verticals and long put verticals are bearish. Because you are buying one option and selling another, you have less theta (time decay) and vega (volatility) risk in a vertical, than you would buying individual calls or puts.

In addition to bullish and bearish considerations, do you want the passage of time to help you (positive theta), or are you willing to let it hurt you (negative theta)? Do you think implied volatility will rise (positive vega), fall (negative vega), or stay the same (neutral vega) during your time frame? Verticals can be created to reflect these sentiment variables, by combining in-the-money, at-the-money, and out-of-the-money options.

At the expiration of the options, a vertical will always have a value between $0 (when totally OTM) and the difference between the strikes (when totally ITM). For example, if the stock price is $120 at expiration, the long 100/105 call vertical will have a value of $5.00, whereas the long 100/95 put vertical will have a value of $0. A long call vertical, or a short put vertical realizes its maximum profit when the stock price is above the higher strike price at the options' expiration. A short call vertical or long put vertical realizes its maximum value, when the stock price is below the lower strike price at the options' expiration.

Short out-of-the-money verticals also make money if the underlying stock doesn't move very much. Time decay works to their advantage, and their risk is defined. That's why they're a good strategy to consider when you're starting out trading options.

While some choose to sell naked options to take advantage of positive time decay, there is a huge risk involved. The short vertical spread carries less risk than selling options naked, and still takes advantage of positive time decay.

Time Spreads

Time spreads are another basic option spread. They are comprised of one short option and one long option on the same underlying, at the same strike price, but in different expiration months. Specifically, a *long call time spread* is selling a front month call at a certain strike, and buying a call in a deferred month (back month), at the same strike. For example, short 1 XYZ Oct 100 call and long 1 XYZ Dec 100 call. A *put time spread* is selling a put in a front month at a certain strike, and buying a put in a deferred month at the same strike. For example, short 1 XYZ Oct 95 put and long 1 XYZ Dec 95 put. In time spreads, one option in the position expires before the other. You have to keep this in mind, because the time differential between expirations necessitates adjustments and presents risks that other types of positions do not.

Time spreads, whether using calls or puts, attain maximum profit when the stock is at the strike price of the options, and the front month option is expiring. Time spreads lose the most value when the stock is very far away from the strike price of the options. If you buy a time spread, you want the stock price to be at the strike price at expiration. If you sell a time spread, you want the stock price to be as far away as possible from the strike price at expiration. The maximum loss is the amount you paid for the time spread, defining your risk.

Time spreads have positive theta (they make money from time passing) and have long vega (they make money if implied volatility rises). Therefore, a long time spread might be a good position, if you think the stock price is going to move and then stay at, a particular strike price until the expiration of the front month option. The maximum profit depends on the value of the deferred month option when the front month option expires, which depends largely of that option's implied volatility. You can position a time spread to be either bullish, bearish, or market neutral, which makes them a very versatile tool.

For example, say you believed ABC stock will stay around its current price of 49.50 for the next 30 days. You could place a calendar spread by selling the near term September 50 calls for 2 and buying the far term October 50 calls for $3. Your net cost of the trade would be $1 ($3 - $2 = $1); the $1 debit is the most that can be lost on the trade. Should the stock be near $50 at the expiration of September, the Sept 50 calls will have no time value left and will expire worthless; the October 50 calls will have approximately one month's worth of time value remaining which should be worth about $2 - the September 50 call price when the position was opened. In this example you would make a about a $1 profit on a $1 investment or $100 profit for a $100 investment in the spread. This is a clear example of the benefit of trading options and learning how to use positive time decay (Theta). This trade made near a 100% profit, excluding commission, with the stock staying flat!

Opening Transaction		Value at September Expiration	
Sell Sep 50 call @	2.00	Buy Sep back 50 Call @	~ 0(or nominal value near exp.)
Buy Oct 50 call @	- 3.00	Sell Oct 50 Call @	~2.00
Cost of trade	$1.00	Sale Proceeds	~ $2.00
		Less Cost	- 1.00
		Profit	~$1.00