Bloomberg Market Concepts - Module 7

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Equity Options: Introduction to Stock Options

Introduction to Options Trading

A key part of being a better and more successful investor is understanding how trading works across various asset classes including equities, bonds, currency, and commodities. In this course, we will unpack options trading to understand how it helps financial professionals execute various transactions to achieve their business goals at a fraction of the price of buying shares outright. In this course, we will explore options trading, which is a contractual agreement between two parties that gives the holder the right, but not the obligation, to buy or sell stock. There is no blueprint for trading options and many people that decide to work in this space learn through hands-on experience. However, whether you want to trade options or simply gain a clearer understanding, this course can give you a solid foundation to continue building on. The topics we will cover are designed to give you a real-world view of options trading and how the Bloomberg Terminal provides insight to market players for idea generation and timely strategy execution. In this module, we will cover the following: what options are and who trades them, the history of options trading, language used by options market players, the role of stock options traders, and options trading strategies. Ready to get started? Let's begin.

Put simply, an option contract is an agreement between two parties for the sale or purchase of an asset, meaning that it is a contract no different from any other kind you might encounter in life. Arguably the most crucial concept of a stock option is that it gives the holder the right but not the obligation to exercise the contractual agreements associated with their option. Let's take a closer look at these contractual agreements by going to the option description, or DES screen. For stock options, one party is a buyer and one is a seller who agree to the same eight contractual components. These include: who buys and who sells, how many listed contracts are traded, what the underlying asset is that the listed option is based upon, what type of listed option is traded, the price of the listed option contract, the price of the underlying asset at which the listed contract can be exercised, the expiration date of the listed contract, and what style of listed option is being traded.

Now that we are familiar with the trade details associated with an option contract, let's further define what is meant by a stock option. A stock option is an instrument that gives the holder the right but not the obligation to buy or sell stock at a certain price at a certain point in time. In other words, once a trader has purchased a stock option contract, it is entirely up to them what they choose to do with it. Another key concept is that the option market distinguishes between a contract giving someone the right to buy stock and that which gives someone the right to sell stock. The option that gives a trader the right to buy the underlying stock is called a Call Option. The option that gives a trader the right to sell is called a Put Option. It is also important to know that, in the US, one stock option contract gives the owner the right to buy or sell 100 shares of the underlying stock. This is known as the contract size and is determined by each option exchange (e.g. the CBOE). This means that if you own 10 call option contracts, you have the right to buy up to 1,000 shares of the underlying stock. An option's DES or description page conveniently brings all these things together, reminding us that a stock option is a financial instrument that gives the buyer the right, but not the obligation, to buy (or sell) a certain stock, at a certain price at a certain point in time.

History

Given the apparent complexity of an option, it could be surprising to learn that options have been in existence for thousands of years. In 350 B.C., the Greek philosopher Aristotle is widely credited with the first written record of an option in his work *Politics*, which portrays the character Thales using options to profit from olive presses during the olive harvesting season. Another famous historical use of options involved the tulip market in the Netherlands in 1637. As tulips were considered an important status symbol, tulip wholesalers began to hedge their risk using options. This eventually resulted in the "Tulip Bulb Mania" bubble, which, in many ways, was a precedent to the 1990s dot-com bubble. In the United States, evidence exists that Over The Counter stock options existed shortly after the New York Stock Exchange opened in 1791, but it took another 100 years before they began to be well known outside of traders. In 1867, Edward Calahan invented the ticker tape stock price telegraph. As has always been the case, the financial markets of the day were keen to embrace this new technology as a means of improving the efficiencies they could offer to investors. Initially, the ticker tape was only used by brokers and bankers, but by about 1880, it had caused a new business to thrive—these were called bucket shops.

Bucket shops were akin to off-track betting parlors, but instead of placing bets on horses, customers put bets on the movement of stocks. As they were not actually taking ownership of the individual stocks and not affecting the share prices on the exchanges, it was nothing more than a form of vicarious participation in the market. These proved hugely popular with the American public, as ordinary investors usually found their access blocked to the organized exchanges due to high margins and large minimum trade size. Indirectly, therefore, the ticker tape via the bucket shops effectively became the Internet of its day, as it opened up participation in the stock market for the masses with none of the restrictions they previously faced. Given the willingness of such institutions to take on small bets, they garnered the nickname "bucket shops" after an old English term coined in the early 1800s. During this time, poor or homeless children drained beer kegs which were discarded from public houses. These "street urchins" (as they were known) would take the dregs to an abandoned shop and drink them. This practice became known as bucketing, and the location at which they drained the kegs became known as a bucket shop. The idea, therefore, was transferred to these financial institutions as they too sought to profit from sources too small or too unreliable for established brokers to handle. In the early 1900s, a "bucket shop" trader called Jesse Livermore increased bucket shops' public profile using a remarkably successful strategy to speculate via options. This strategy was so successful that even today, Livermore is still recognized as one of the greatest traders in history.

It was not until the 1970s, though, that option market volumes began to grow. This coincided with Fischer Black and Myron Scholes publishing their 1973 article "The Pricing of Options and Corporate Liabilities." Their Black-Scholes equation, which was immediately adopted as the industry standard for pricing options, had a transformative impact on the field. Consequently, Black and Scholes were awarded the Nobel Prize in Economics. 1973 also saw the birth of the Options Clearing Corporation (or OCC), which was created to ensure that option contracts are fulfilled in a timely and reliable manner. On April 26, 1973, the Chicago Board Options Exchange (CBOE) also opened, creating America's first listed stock option exchange. On its opening day, only 911 listed contracts were traded, but within a month, the listed market's average daily volume had already exceeded that of the Over The Counter market.

In 1983, index options began to trade, further increasing the popularity of the stock option market. Then, in the mid-1990s, the emergence of online trading made options instantly accessible to the general public for the first time. It had never been easier for an individual investor to trade stock options, and this resulted in the depth and liquidity of the option market being larger than ever before. Indeed, by 2019, the OCC recorded that the average daily volume of stock options traded was 17.5 million contracts—an impressive growth from the 911 contracts that were traded on the CBOE's first day 46 years ago. In this module, we will learn the fundamental concepts behind this vitally important financial market, the players who are active in this market, the language used in this market, and some strategies you might use to profit from the stock options market. Here we see the Most Active Options or MOSO function. This bubble chart shows there are many different options of different transaction volumes being traded on three given days.

Trading Stock Options

Most option trading is done on a derivatives exchange. We saw earlier that these exchanges standardize the contract size and allow for a timely and accurate fulfillment of a traded option contract. In the United States, the most important option exchange is still the CBOE. Even though it created a fair and orderly market on just 16 stocks in 1973, this has grown to over 3,000 in 2019. Previously, exchanges used to feature the open outcry system of trading pits. Having been made famous in many Hollywood movies, people often picture traders in brightly colored jackets screaming at each other across a crowded trading pit while waving bizarre hand signals at each other in a maniacal fashion until they collapse with exhaustion when the closing bell rings. Until quite recently, trading options on an exchange's trading floor was no different. These days, however, such open outcry pits have been phased out with exchanges replacing them with electronic trading via computers. While this is perhaps less attractive for movie makers, it has resulted in cost savings and operational efficiencies which have been passed on to traders and individual investors in the form of lower commissions.

It is worth noting that not every stock option is traded on an exchange. For traders who have a need to trade a non-standardized contract, they have the opportunity to contact a financial institution directly to negotiate an Over The Counter or OTC stock option. While this flexibility may seem attractive, the bespoke nature of these contracts makes liquidity (or market interest) in them much less than standardized exchange-listed contracts. It also removes the guarantee that a clearing house (in the U.S., the OCC) provides to listed options that the contract will be honored.

Who Trades Options?

Derivatives generally exist as a tool for one party to transfer risk to another. In this sense, stock options are no different, with market participants hoping to avoid risk or take on risk. People who trade options can be broadly categorized into three types of participants: Hedgers trim risk on their trading books to make sure positions don't become uncared for and overgrown. For example, traders who currently hold an underlying asset (like a stock) can use options to manage the associated risks. Hedgers, therefore, look to use options as a means of offsetting directional risk. Speculators are traders who wish to make a profit by capitalizing on a specific view they have on the future price movement of a stock. Speculators use capital that they are prepared to lose in the hope for future profit. Arbitrageurs are traders who try to earn a "riskless profit," meaning they take multiple positions to create a riskless scenario in order to earn a small profit from a temporary market inefficiency. Not every trader will adopt a style that is purely one of these categories. Traders can often blend these together depending on the primary concern at a specific moment. We will now look briefly at the most common six "who's who" in the stock option market.

Market makers are the biggest contributors to volume in option markets. They are obliged by the exchange to provide two-way prices—that is, prices they are prepared to buy and sell an option at. Market makers are essential for creating liquidity, as traders know there will always be a price provided to enter and exit a position. In 2019, the top liquidity provider of listed U.S. stock options was Citadel Securities.

Proprietary traders are speculators who trade for institutions that use the firm's own capital for risk-taking positions. These are often associated with hedge funds like Bridgewater Associates.

A portfolio manager is a trader (or team of traders) that acts on behalf of a financial institution that manages someone else's money. They are typically associated with pension funds and asset managers; because of this they are sometimes referred to as "institutional investors," for example BlackRock and CalPERS (or the California Public Employees' Retirement System).

High frequency traders use a style of electronic trading that targets arbitrage opportunities. They are sometimes referred to as "Program Traders" due to the significant investment needed in state-of-the-art technology to develop the IT infrastructure and trading algorithms required to be successful. An example of such a firm is Virtu Financial.

Structured equity traders are usually employed by "investment" or "sell-side" banks like J.P. Morgan, who sell structured equity products to sophisticated investors. These products often have complex over-the-counter exotic derivatives embedded in them that the structured traders need to hedge via the vanilla listed options market.

Retail traders are essentially you and me. They are defined as a holder of a small account, using their own money to trade options for financial gain or to hedge their current holdings. Hence, retail traders can straddle both speculative and hedging styles. Given that their risk tolerance is usually much lower than that at financial institutions, they are usually characterized by some of the more conservative strategies that we will discuss later.

Why Trade Stock Options

We now know the basics of what an option contract consists of, who trades them, and where we can trade them. Why, though, might you actually want to trade one? Options are considered a financial derivative as they derive their value from an underlying financial asset. As stock options derive their value from the performance of the underlying stock (or equity), stock options are considered a type of equity derivative. As an equity derivative, stock options can offer four major benefits to an investor instead of trading just the individual stock. These advantages include cost efficiency, increased profitability, minimizing loss or providing insurance, and offering strategic flexibility.

Many people are initially surprised to learn that when buying an option, you aren't buying anything physical. Our contractual definition shows that no asset is actually transferred until the buyer of an option chooses to exercise their right. As option contracts trade at a deep discount to the underlying stock, this gives them substantial leveraging power. This is desirable to traders as it produces cost efficiencies. Let's use Booking.com as an example. We'll type "Booking" into the command line and select the equity. Next, we will click on the Description Page, or DES, to learn more about the company. Then we'll type in Options Monitor to go to the OMON screen of Booking Holdings. *[Pimm: OMON should be pronounced "O-mon" rather than "O-M-O-N"]* Here we can see a one-month call option to buy Booking stock at $2012.50, which cost $54.10 in November 2019. In comparison, Booking stock cost $2007.23. In order to control 200 shares of Booking, therefore, you would need a capital outlay of:

$$\$2012.50 \times 200 = \$402{,}500.$$

Using the option market, though, you would only need to buy 2 contracts (as US option contracts have a 100-share contract size). Now, the capital outlay would be:

$$(\text{number of contracts} \times \text{contract size}) \times \text{option price}$$

$$(2 \times 100) \times \$54.10 = \$10{,}820.$$

This strategy substantially reduces the funds an investor has to commit, allowing the balance to be redeployed elsewhere.

Options can be used as a robust hedge to an existing stock or portfolio position. As put options give traders the right to sell stock at a certain price at a certain point in time, put options can be used as "portfolio insurance." This is because they can be used to protect traders against a downwards move in stock. For example, if we had previously decided to purchase Apple stock at $219.00, we would be concerned about the stock going down. As such, we could also have purchased a put option to protect us. Let's take another look at the OMON screen to see which put options are available in the listed market. In this instance, a one-month, $220 put option on Apple would have cost us $5.70. Now, if Apple stock had fallen to $197.10 in one month's time, we would have lost:

$$\$219.00 - \$197.10 = \$21.90,$$

which is approximately 10% of our holding's value. By purchasing this put option, however, we now have the right to sell our stock at $220. This means that all we have lost is the price we paid for the option. This

was $5.70, or the equivalent of about 2.5% of the stock's value. It's still a loss, but a much smaller loss and in comparison, we have still outperformed the general market.

Options do not always need to be traded individually. There are many ways to combine options in advanced, strategic ways to create different payoffs and "synthetic" positions. Indeed, this can even be used to make money for an options trader when the market doesn't even move. As a result of this, options traders are sometimes said to think about the market in "three dimensions." If we go to the screen XLTP XSTR, we can see downloadable Excel templates to aid in strategy pricing. While advanced strategies are largely beyond the scope of this module, we will briefly touch on some of the easier strategies later.

Conclusion

So far, we have learned about the history of options, the evolution of stock options in the United States, what an option is, who trades them, and why they trade them. We have learnt that they can be traded in conjunction with regular equities or on their own. We have also learnt that options can be used to increase the profitability of trading strategies, minimize losses, increase the flexibility of a trader's strategy, and improve cost efficiencies for traders. Given this, we should begin to have an appreciation of just how powerful a weapon stock options can be for a trader to have in their arsenal. Indeed, when understood and used correctly, they can be a vital component to any trading strategy and can help you on your way to emulating the successes of Jesse Livermore! Now that you have a good understanding of the who, the what, the where, and the why of the options market, you are probably keen to jump straight into the deep end and start trading! However, before we are able to do this, we need to talk the talk before we can walk the walk. In the next section, we will learn the language used by options traders to prepare ourselves for our first options trades.

Equity Options: Using the Language of the Options Market

Introduction: Options Terms and Core Concepts

Inspired by our interest in options and the articles we've read about successful traders, we decide to apply for a position as a junior trader at Big Bucks Capital. It's now our first day on the desk and the trading floor is buzzing with the usual hum of business that accompanies daily life when the markets are open. You are keen to make an impression and as you settle in, you make a point of listening carefully to the conversations being shouted across the desks and on the phone. Within an hour of the Opening Bell ringing, you hear a range of words and phrases for the very first time. While the seasoned veterans sitting around you understand instantly what is being said, the new terminology can be confusing for someone who has so far only encountered options in a textbook. Let's listen in to some of the conversations and break them down in order to understand what is being said.

Options Terms and Core Concepts

This phrase is something that you might hear two traders say when discussing a recently transacted options trade. Let's examine what they mean on this OMON screen. An option's premium is the market price of an option. As such, it becomes the price paid by the option buyer to the option seller for a specific contract. Using the OMON screen we can see that the only option listed for sale (or with an Ask Price of) 10 cents is the SPY, October 18th, 2019 304 call options. Unlike stock traders, not every option trader is necessarily concerned with the dollar and cents price that an option commands. Let's right-click on the 10-cent price and select OVL – The Listed Option Valuation calculator – for a closer look at this option. Some traders do, however, pay particular attention to price. These traders tend to be both speculators and hedgers and may refer to a strategy that focuses solely on price as a "pure premium play". Let's click on the Scenario tab to look at a break-even graph for this option. Related to premium is the concept of breakeven, as this is the price that the underlying needs to be trading at during expiration for the trade to "breakeven." Hence, it's the threshold a trader monitors to determine if they lose or make money after taking into account their

initial outlay.

You may hear this shouted by a salesperson on the phone with a client to a trader at a bank. Let's look at the price for January expiry on the OMON screen. We can see that this phrase is really two key concepts paired together: the strike price and expiration date of the option that the trader has to give a price on. We can also see the same information on the OVL screen. Strike is short for Strike Price, alternatively known as the Exercise Price. This is the price at which the underlying stock will be delivered if the option is exercised. It is important that this is recorded accurately because if it is booked incorrectly, it will affect how profitable a trade is—or even if a trade is profitable at all. Expiration is shorthand for expiration date or expiry date. This is the last day that a stock option is valid. In the U.K. and the U.S., this is usually the third Friday of the month. This is important to traders because after this date, your option ceases to exist and you have no right to exercise. As such, the phrase "timing is everything" is especially applicable to option traders because few things are worse than your option expiring on a Friday and then seeing your expected event happen on the following Monday! *"It's only the Ats I'm interested in."* This is a phrase you may overhear as you walk past a trader speaking on the phone to his broker. ATM or "Ats" stands for At The Money. These are options that have a strike price closest to where the underlying asset is currently trading. As a result of this, it is currently uncertain if it makes economic sense to exercise these options. You may also read "OTM." This is trader slang for Out of The Money, which in turn, is a short way of saying that it does not make economic sense to exercise the option. As such, all call options with strikes above the underlying stock price and all put options with strikes below the current stock price are considered Out of The Money. A final abbreviation you may see is ITM, shorthand for "In The Money." This is trader shorthand for options that have strike prices that would make economic sense to be exercised. All call options with strikes below where the underlying is trading are considered In The Money. Similarly, all put options with strikes above where the underlying stock is trading are also considered In The Money. As a result of this, In The Money options are more expensive than At The Money options, which are more expensive than Out of The Money options. A savvy and profitable trader tends to have a good track record of seeing the Out of The Money options and At The Money options they bought finish as In The Money options.

This is a phrase you could hear when a trader is discussing the price of an option. Let's take a closer look in the Bloomberg Terminal. Go to the options monitor or the OMON screen and select edit columns from the settings dropdown. We'll enter intrinsic value in the search on the left and add it to the data items on the right. We'll also add time value. Now we can tick intrinsic value and time value and move them where we want them to appear in the OMON screen. In this case, after the bid and ask price data. The concept of intrinsic value and time value are linked closely to that of premium and at the money, out of the money, and in the money. There are two components to an option's premium: intrinsic value and time value. In turn, these are linked closely to an option being in, at, or out of the money. Intrinsic value is essentially the difference between the stock price and the strike price. As such, it can be viewed as the measure of the true value associated with the "right to exercise" held by an option. Because of this, all in the money options have intrinsic value, while all out of the money options have no intrinsic value. Time value can be viewed as a measure of uncertainty associated with the option. In other words, this is the potential that the option could hold more intrinsic value in the future. Due to this uncertainty of whether an option will be exercised or not, at the money options will exhibit the most time value. Furthermore, the longer the period to expiry, the more uncertainty surrounds the stock's price movements, so the higher the time value is. Conversely, as expiry draws closer, there is less uncertainty, so traders see this time value erode. *"Did you trade American or European?"* This question is something a trader may ask his salesperson but has nothing to do with where a stock trades, where a client is located, or even the nationality of the institution conducting the trade. This is referencing the type or style of the option being traded. Traders ask this question to be certain of the rights as option holders or their exposure as option sellers. While both share similar characteristics (for example, a strike price, an expiration date, similar ticker symbols, and exchange traded), the key difference is when they allow a trader to exercise them. European style options allow the trader to exercise them only on the expiration date. In the US, options on indices like the S&P 500, the Dow, and NASDAQ are usually European options. American style options, however, can be exercised at any time during their life. In the US, all single stock options (that is, those on individual names like Twitter and Amazon) and exchange traded fund (ETF) options (including those ETFs that track the major indices like

SPY) are American options. It is important to remember that the style of a stock option does not make one more inherently desirable than another. Instead, traders need to remember what the style of option they have positions on, as this has important risk management implications. *"Is it cash or physical?"* This is a question you will probably hear traders ask their salesforce. It highlights the many variables that option traders deal with when compared to regular stock traders. This question relates to the settlement type of the option. Traders need to know this because it determines if they are responsible for delivering physical stock or the cash equivalent. Index options are usually cash settled as it is more convenient than the trader arranging the delivery of hundreds of stocks when exercised. In comparison, single stock options are usually physically settled. This means that it involves the actual delivery of shares of the underlying stock. This is the most common form of options settlement and means a trader could have a residual position in stock rather than cash funds. In the case of European vs American options, nothing can be more embarrassing, or potentially costly, than not booking the correct type of option. This is because a trader can end up with a residual stock position when they were expecting to receive cash. After this, they are exposed to the mercy of the market once it reopens after settlement before they can get out of this unexpected position!

Quite simply, exercise is the process by which an option holder notifies the option seller of their intention to take delivery of the underlying contract. Statistics provided by the CBOE suggest that since 1973, about 70% of stock options expire in the money. This suggests, therefore, that choosing to exercise is an important part of an option trader's job! The "choice" of the trader to exercise or not relates back to our earlier definition when we learned that a trader has the right, but not the obligation, to exercise their option. In almost every situation, a trader will utilize their right to exercise their option when it makes economic sense. In rare cases, however, the trader may not want to do this. In such examples, given they are not obliged to, there is nothing forcing a trader to exercise as they have no obligation to do what appears to make economic sense. In such situations, a trader needs to make sure that they are 100% certain of why they would not want to do this as it could be an extremely embarrassing (and expensive) mistake! Because a trader has the right to exercise an American option at any time they choose, sellers (or writers) can be "surprised" when they receive an "assignment notice." Assignment takes place when the option written (or sold) is exercised by the option holder (or buyer). Writers of European options know that they cannot be assigned before expiration so they do not have to be concerned with this. For writers of American options, however, such a surprise has the potential to leave you with an unexpected stock position. Generally, though, there is a clue that traders can use to anticipate assignments. This clue is that an option will no longer have any time value associated with it, so traders see no economic value in holding it any longer.

This is something a trader might say when being asked to describe his position relative to that of the rest of the market. Here we have the OMON page. Let's add a column for Open Interest by going to Settings, Edit Columns, and adding Open Interest. Earlier in the module, we discussed the advantages that listed options have when compared to over-the-counter options. Namely, this was the liquidity offered by market makers resulting in listed options being bought and sold whenever the exchange is open. This means that if a trader buys an option in the morning and then news breaks resulting in the trader changing their view, the trader can still sell that option in the afternoon to exit their position. In this instance, the initial trade resulted in a position being "opened." Because of this, the trader specifies that this is an "opening trade." Conversely, the sell of the option is marked by the trader as a "closing trade." Exchanges keep track of these trades via the concept of "open interest." As opening trades add to the open interest number and closing trades reduce this number, open interest indicates the total number of option contracts that are currently outstanding. As a result of this, the open interest figure is not static. The number is updated daily based on the previous day's trading activity and explains why, in this example, the daily volume exceeds the open interest. We also need to remember that as we do not know how many of the 211 contracts that traded today were marked as "Opening," we cannot predict what tomorrow's Open Interest figure will be. Open interest is useful to traders as it gives information regarding the liquidity of a particular option. This is both in absolute terms when compared to other strikes or maturities and also in relative terms of a trader's transaction size compared to the market. *"I'm seeing a 50 delta."* This is something you could hear a trader say to his broker or salesperson when trading an option that is part of the previously discussed "pure premium" strategy. Here we see the Delta on the DES screen. Delta is an important concept in option trading as it is one of the "Greeks" that option traders assign to monitor the various risks inherent when trading options. The delta reflects the

sensitivity of an option's theoretical value to a change in price of the underlying asset. This is important for traders who want to hedge their option positions with the underlying stock as this figure can be used to work out the number of stock they need to buy or sell to "tie" to the option to be "delta neutral." When the delta is negative, the trader needs to neutralize this by buying stocks. When the delta is positive, the trader would neutralize this by selling stocks. To calculate the correct number of stocks to trade, the number of the delta (in this case 50) is multiplied by 100, and then multiplied again by the number of listed options traded. By doing this, the trader is ensuring that they will be protected from sudden moves in the option's value by using the correct stock position to protect (or hedge) themselves. We can also see the delta on the OVME page. Delta can also be viewed as the probability of an option being in the money at expiration. The higher the delta (between 0 and 100), the higher the probability. The lower the delta, the more aggressive (or optimistic) the purchase is. Now it should come as no surprise to learn that at the money options will have a delta of about 50 assigned to them as there is often a 50:50 chance that the option will end up in the money.

Option traders tend to obsess about volatility, which inevitably gets shortened to "vol." This is because it is a vitally important concept central to option trading. The reason for this is that it is the only input into the Black-Scholes equation that is unknown. Given this, as a new trader, you should not feel disheartened if this concept is unfamiliar. One can, however, reasonably infer that it is directly linked to the speed of the market. Meaning, if an underlying stock has the potential to change price by a great deal in a short amount of time, that stock is said to be volatile and will be assigned a high volatility number. At this point, it is important to remind ourselves that options traders are concerned with two types of volatility. These are historical volatility and implied volatility. Historical volatility is often referred to as realized volatility, as this is how the market has moved. As these price movements have already been witnessed and recorded, it is possible to perform a calculation based on the standard deviation of logarithmic returns to calculate how volatile a stock has been. As a result of this, realized volatility is considered backward-looking and there is very little argument between traders as to what the correct figure is. This is what we see when we look at the Historical Graph Volatility or HVG function. The second kind of volatility is what we see on the option monitor screen. This type of volatility is being implied from the option market because it is what traders are using in their pricing assumption for options. Consequently, it is considered the market's expectation of future volatility for the duration associated with that option maturity. In contrast, therefore, this type of volatility is forward-looking and actually difficult to prove if the value assigned to it is correct. This is because it is not possible to directly measure it, with it being based purely on traders' estimates. Let's take a closer look using Booking Holdings. We'll enter historical volatility graph and select the HVG function. Successful option traders spend a long time analyzing how volatility has changed over time (historical volatility) and how options prices are inferring the stock could move in the future (implied volatility). Traders often look at the differences between these two values to help in their trading assessments. This is because, like everything else in trading, volatility is essentially a single number for which a trader is constantly looking for clues as to whether it is relatively high or low. Traders who think that implied volatility looks too low (meaning they have a view that vol is cheap) will buy options, and those that think vol is too high (or expensive) will sell options. OMON also shows you in the IVM column the implied volatility of the mid-market price. The mid-market price is the midpoint of the Bid and Ask prices. There can be many heated debates on trading floors surrounding vol levels associated with stocks. The good news regarding this is that the market can always allow you to express your view, and your profit or loss at the end of your trade will provide a definitive answer as to who was correct!

Conclusion

By translating the language used by option traders, you probably notice that being detail-oriented is a helpful characteristic for an option trader to have. While it might sound impressive to use these terms, it should not be forgotten that it all plays an important role in understanding what risk you are entering into when agreeing to trade an option. Feeling confident that you can now talk like a seasoned option trader? Then let's learn how to walk the walk.

Equity Options: The Role of a Stock Options Trader

Introduction to Stock Options Trading

Now that you've impressed as a junior trader, you've been promoted to prop trader at hedge fund Big Bucks Capital. We begin our day by examining research on Alphabet, the parent company of Google. We'll type business intelligence company primer and select the function BICO. After reading an analyst's research note, we see that Alphabet is undervalued and we would like exposure to the upside potential of the stock. On the Graph Price or GP function, we see that the stock is currently trading at $1317.36. We would like to own 10,000 shares but quickly realize that by buying the stock outright, it will result in us tying up over $13 million of capital! Instead, we can be Speculators and use the OMON function to examine what the options market can offer. Many new traders can often experience "contract shock" in such a situation. Unlike their stock trading counterparts, options traders have a seemingly bewildering assortment of contracts available. With so many strikes and maturities across both calls and puts, how can we choose the right contract?

Forming an Idea

Re-reading the analyst's research piece, we crystallize our view that we expect Alphabet to have 5% of upside in the next month. We know that the time value of an option increases as time to expiry increases. Consequently, as we are confident that the move will happen at some point in the next month, it is unnecessary to pay extra for the unwanted time value incorporated in options with maturities past one month. This, therefore, helps us choose the next month, or "front month" set of contracts. If we change the expiration to the month following the date we captured this, and we change the number of strikes to 25, this will expand the number of relevant strikes that we can see on the Terminal to help us place a trade representing our view. As we know that we want to profit from an upside move in stock because we are "bullish," we can further narrow down the section of the OMON screen we are interested in by focusing on the call options on the lefthand side of the screen. Given this, we are now only interested in the call options that are in the front month. This leaves us with only one missing piece of information before we can call our broker: what strike do we choose?

Choosing a Call Option

We recall that cost is highest for in the money options, so we should try and avoid these. Upon looking closely at the list of options available (the "options chain"), we can see that anything lower than the $1315 strike is unnecessarily expensive. We also know that we may not want to trade anything above the $1410 strike as this would remain out of the money. Choosing a call option between $1315 and $1410 is now something that is more of an art than a science. Perhaps, though, we decide that buying (or being "long") the 105% strike offers a good balance between cost, risk, and reward. Looking again at the OMON screen, we see that this would correspond to the $1380 strike and that we would need to pay the market maker's offer price of $9.20 to buy this. We can now call our broker and tell them that we are "$9.20 bid for 100 GOOGL December $1380 calls." Within a few minutes, we get a call back from our broker who says we are "filled at $9.20." This is market slang for saying that our broker found a market maker who sold to us our desired 100 GOOGL calls at our bid price of $9.20. Congratulations! You've just executed your first options trade—and for much less of an initial outlay than buying the stock! Now all we have to worry about is understanding the risk associated with it and how we make money.

Call Options Payoffs

Using the OVL function we can create this trade and also see the risks associated with it in the scenario tab. As this is our only position in GOOGL, we are what is known as "naked long." This means our payoff depends entirely on the performance of the call. This is shown by the green line called "profit and loss." This chart shows a horizontal straight line that becomes a diagonal line at 45 degrees, extending infinitely upwards. This is an accurate shape of the performance of a call option and makes perfect mathematical sense. By holding our mouse over different parts of the line, we can explain why this is correct. We have paid $9.20 to enter this trade, meaning that this is both a "net debit" trade and a trade where we will never

lose more than our initial outlay. The green line reflects this by showing a maximum loss of $9.20 below the white breakeven line at $0. We begin to reduce our loss at $1380, crossing the breakeven line at $1389.20, and then making a profit from this spot price level upwards. Why, though, are we not in the money until $1389.20 when the strike of our option is $1380? This reflects the fact that we paid $9.20 for our call option, so the stock needs to rise by the price we paid (in this case $9.20) before we become profitable. Hence, $1389.20 becomes our breakeven level.

Profits

We can also see that above $1389.20 our payoff graph should be at a 45 degree angle, extending infinitely upwards. Why? Because once the option becomes in the money, it will trade at intrinsic value. Given stocks have the potential to increase in price infinitely, we can see that this is reflected in the one-to-one relationship between the movement in GOOGL stock and the underlying value of the call option. Evaluating our position, we can feel happy that we have not committed a lot of capital to this trade, have a limited and capped loss to the downside, and have theoretically unlimited profits on the upside. All we have to do now is wait and see if our view is correct!

Expiration Date

On our option's expiration date, we check the Historic Price, or HP, function to see the price of Alphabet stock at the market close. We find that GOOGL is now trading at $1409.20 and our view was correct! Our option has expired in the money and we have decided to exercise it to be the proud owner of 10,000 GOOGL shares.

Forming a Strategy

After successfully speculating, we might now be concerned about preserving our position. To do this, we can change our mindset from being a Speculator to a Hedger and think about how we can use options to protect our long stock position. We know that being naked long stock exposes us to downside movements in stock. We look at our calendar of events and see on the Earnings History page that Alphabet is due to announce earnings in six weeks. We remain bullish on the name but are concerned that some bad news may be released during the conference call and cause the stock to sell off. Because of this, we should turn our attention to the put market to buy some insurance via a protective put.

Choosing a Put Option

We know from the OMON screen that we are again concerned with the March options as that is when earnings are due to be announced. We also know from the OMON screen that we need to buy 100 put options (or "lots") to fully protect our stock holding as the contract size of Alphabet is 100 shares. Studying the OMON screen, we need to make a choice between an at-the-money put or out-of-the-money put. Looking at the option chain and reading more analyst reports, perhaps we maintain our overall bullish view and believe that Alphabet can and should go higher after earnings. We know, however, that earning calls can be unpredictable and looking at the relative costs, we decide that we'd like to prevent a loss but at the lowest possible cost. We know we entered the trade when GOOGL stock was at $1,317.36 so we decide that we can save some money and buy an out-of-the-money put at $1,310. This is being priced at $66.90 in the market and offers substantial savings compared with the at-the-money put, $1,400, that is being offered by market makers at $117.20. Consequently, we should tell our broker that we are happy to "lift" (or pay) this market maker's offer. Once again, we call our broker and tell them that we are a $66.90 bid for 100 GOOGL March $1,310 puts. A few minutes later we get a call back saying that we're filled—meaning we have now bought some downside protection.

Protective Put Payoff

With this trade, however, we did not buy this option naked. As we are hedging our long stock position by laying off part of our downside risk to the market, this is now called buying a "protective put," sometimes

called a married put. Paying a premium for the protective put is similar to buying insurance because if the price of the underlying drops, we've bought some protection. This happens because at expiration date we have the right to sell our stocks at the strike price of the put, meaning the only loss you will incur is the difference between the spot price and put strike price. Let's take a look at how our risk profile now looks using the OSA function after we've added our stock and option to our portfolio. Immediately, we can see that the shape of the profit graph of this position is exactly the same as that for being naked long a call. By looking at the spot price on the X Axis, and paying attention to how the profit and loss changes on the Y axis, we can see that we are exposed to downside risk on a one-to-one ratio until the protection offered by the put (minus our initial debit or outlay) is taken into account. After that, we do not lose any more money. However, given that we are still bullish on GOOGL's performance and that we did not want to pay too much money for this insurance, this looks like a good risk-reward profile as we still have unlimited upside potential. All we have to do now is sit and wait for Alphabet to start their earnings call.

Market Perception of Earnings

Looking on the CN function at Bloomberg, we see Alphabet release their earnings in real time. The numbers look good and we are confident that the stock should move higher tomorrow. Indeed, when the opening bell rings we can go to the Intraday Price Chart or the GIP function to see that Alphabet stock opens significantly higher and our long stock position is making money. Even though it was good risk management to do it, we notice that the value of our put is now almost worthless. However, as we decided to buy one of the cheaper puts available to us, overall we are still making money from the stock move. We are pleased that our views so far have proved to be profitable. However, we are keen to earn back some of the premium we have spent on our protective put.

Post Earning Strategy

Once the news from earnings has been digested by the market and after reading more analyst reports, we remain generally bullish on Alphabet but are aware that it has had a large upward move in a short space of time. It's possible, we believe, that the market may decide to take some profits and as such, this selling might restrict any upwards move and possibly even push the stock slightly lower. With this view, we are essentially saying that we do not see much short-term upside potential but see enough medium-term upside potential to continue holding our long stock position. If we examine this view further, our opinion is that, in the short term, upside calls could end up expiring worthless. Hence, we do not want to buy these calls but we should be happy to sell them. This is because we will collect premium for selling them and we do not have the expectation that they will be exercised against us.

Income Strategy Selection

This is another area where options differ from stock. When someone sells stocks that they do not own, they must first borrow the shares, which incurs a cost. This is not required when selling options short as the nature of options means that the transaction is creating a contract. As a result of this, the common term to describe the opening sale of an option is to say it's been "written." This term has survived from the early days of option trading when a physical paper contract was issued by the seller and delivered to the buyer. Obviously, technology advancements mean that this no longer happens but nevertheless, the term still survives. In this instance, we are considering what is called covered call writing. That is, selling a call on an underlying that we already own stock on.

Call Overwriting Strike Selection

When we consider how to do this, we recall our short-term view and decide to focus on front month call options. Our view is to retain all of the credit (or income) we get from the sale of the call option. To achieve this, we need to sell a high enough strike to avoid it being exercised, while choosing a strike with enough premium to make it economically attractive. Looking at the strikes, we settle on the decision that the 105% call should meet our criteria as we do not expect a further 5% appreciation in stock. Looking at OMON we

see that market makers are a $12.90 bid for this call, which we are happy to "hit" (or sell at). Now we have decided on this, we can call our broker and tell him that we are a seller of 100 of these GOOGL calls at $12.90. As a side note, you might also begin to notice how puts appear to be more expensive when compared to calls. This is not uncommon in the options market and it is what option traders refer to as the "skew" associated with a specific name.

Strategy Formation

We decide that we have tied up too much cash in our Alphabet position and we would like to use some of the proceeds from our sale in other strategies. As such, at expiration, we also decide to sell our stock, leaving us in no position in the underlying. A few weeks pass and we notice that Alphabet has now been selling off. We are glad that we no longer have a long position in it, but we analyze the news and think that it does not warrant such an aggressive downward move. We continue to monitor the name closely and we see that it continues to fall. We learned earlier that as the "speed of a market" increases, then the volatility associated with stock increases. To check if this is true in this instance, we check the HVG function and see that short-term volatility has spiked! With our interest piqued, we decide to see how this compares to how it has been historically by using the GV function. By looking at both, it seems that volatility is exceptionally high. We recall from our discussion on option pricing via the Black-Scholes equation that high volatility means option prices are expensive. We also recall from our analyst note that our view on this stock is bullish and upon reading some related news stories, we do not see a reason to change this medium-term view. Given this, we need to find a way that isn't immediately capital intensive yet still profitable to benefit from this unexpected market situation.

Put Writing

A good solution would be to sell a downside put. This is because we know option premiums are exceptionally high historically. We also know that they do not tend to realize this value historically either. As such, buying options (or buying volatility) at this level seems a loss-making trade. However, we also know that if we sell calls, we may be in a position that will actually see us being short stock if we are called away. If we sell a put, however, we have seen that they tend to be more expensive than calls due to the effect of skew, so we stand to receive more premium. We also know from our experience of selling the protective put, that if the market rallies, an out-of-the-money put (say 90%) will not only have been somewhat expensive but it will also expire worthless and we will keep all of our premium. If, though, the market continues to fall and our put is exercised against us, what is our obligation and should we be worried? In this instance, we are probably still happy if this happens. This is because if the holder exercises the right to sell stock to us, we will end up buying the stock at an even deeper discount to where the stock is trading now. Given our overall medium-term bullish view on the stock, we could view this as us effectively buying the stock at a bargain price! Meaning if we like buying the stock at the current market price, we should love buying it 10% cheaper. As such, we should contact our broker to sell the 90% front month put, so we can initiate this naked put writing trade.

Conclusion

If this is all beginning to make sense, then congratulations. You are well on your way to becoming a savvy, successful options trader, and we can now look at some more advanced strategies.

Equity Options: Basic Multi-Leg Strategies

Introduction to Basic Multi-Leg Strategies

So far, we have incorporated successful option trading strategies by trading just a single option at a time. Option trading strategies, however, are not restricted to trading just one option (or leg) at a time. Option traders often employ multi-leg strategies — that is, trading more than one option in a combination — in order to be more cost efficient and improve the risk profile. Some of these combinations are in a one-to-one

ratio, and some more complicated strategies involve different ratios of each option for each leg. In this section, we will trade three of the most common two-leg strategies: a straddle, a strangle, and a collar. Let's explore a straddle.

Rumors of a New Product

After writing our downside put, Alphabet stabilized, volatility dropped, and at expiry our strike level was not breached. As a result of this, we retained our entire premium and did not end up getting assigned any stock. Even though we have no position in the name, we have been monitoring news flow associated with Alphabet on the company news CN function because we feel like we have a good understanding of the underlying and have been trading it profitably. By doing this, we become aware of rumors involving a new product release. There does not appear to be much substance to the market chatter, but the sheer volume of reports hitting social media and online news sites makes us believe that there must be something behind them. The general consensus is that no one really knows when in the next two months this release will be or when exactly it will happen. It is, however, expected to be big. As a result of historical trends following product releases, you develop the view that whenever the new product is released, it will have a material impact on how investors view the stock and this will result in a substantial move in the stock price. You are unsure, though, how the market will receive this rumored announcement — will it love it or hate it? You believe that if the market loves it, the stock will soar, but if it hates it, the stock will drop rapidly. Once again, we look to the option market on how to reflect and profit from this view.

Straddle

One of the simplest, but at times most effective, multi-leg strategies is the straddle. This is so called because we are going to use a put and a call to simultaneously "straddle" a specific strike. When buying a call and a put at the same strike price and with the same expiration, we are said to be "long the straddle." Given our view, we know if we continue to trade just front month options, we stand to miss out if the event happens in the following month. As such, we should be prepared to pay the extra time value associated with a two-month option. With a straddle, we know we have to purchase a call and a put, and we have determined which expiration date to focus on. We also know that both options have to be of the same strike, but how do we determine which strike?

Since we are purchasing both calls and puts, we should immediately realize that if we try and cheapen the call by purchasing an out-of-the-money one, we will incur increased costs on the put leg as that will become in the money. We will encounter the same situation on the downside when we buy an out-of-the-money put, as the call will become in the money. As such, it's extremely common for straddles to be traded at the money as this typically provides the cheapest combination and the most liquidity at inception. Let's open OVME, our Option Valuation Equity/Interest Rates calculator. Once we have confirmed with our broker the price we are bid for 100 at-the-money straddles and they tell us we are filled, we should examine the payoff closely in the OVME function to ensure we understand our exposure. Once we have understood our exposure, we should select "Products" from the red task bar, then "option strategies," and then "straddle." We now see our option pricing calculator where we can enter our trade details. Then we can click on the Scenario tab on the lower grey toolbar to see the corresponding payoff diagram.

By now, you probably realize that this is a *debit* strategy, as it is a net cash outlay, so our maximum loss is capped at our initial premium outlay. Hence, we have limited risk but seemingly unlimited profit potential in either direction! To many new traders, this appears to be an attractive strategy because it seems the odds are skewed firmly in our favor to make money from this trade. This is good for us because we think whatever release Alphabet is planning is going to cause the market to move sharply up or down and continue in that direction. We need to be aware, though, that if the anticipated move does not happen, or indeed if the anticipated new product release does not happen, then this could be a painful trade as we will lose 100% of our initial outlay. In this situation, the trader who sold this straddle to us (and so is, "short the straddle") will realize maximum profit at our expense. Let's take a look at Analyst Recommendations on ANR. It is important to note here that it's extremely beneficial to have a market-making view before the rest

of the trading community also holds it. This is because if the market-makers share our view, then they will price such a straddle accordingly, meaning the elevated premium may not make the purchase an attractive risk-reward proposition. In this instance, however, we have been savvy traders and done our homework. We see that we are ahead of the market in having this belief, so as speculators, this 2-month straddle looks good value for money.

After two months, the news goes quiet and Alphabet stock is not moving much. The rumors do not materialize and come expiration date, our straddle expires worthless and we are annoyed that we have wasted our money with this strategy. Suddenly, a few days after expiration, we see a tweet from an Alphabet "insider" who explains that the reason nothing has happened was due to an unexpected hitch. It goes on to say that it will be unveiled later this month and it stands to be an even bigger product than anyone imagined before. We are naturally a bit cautious, as we have been burned by similar claims before. However, our gut is telling us that there could be a grain of truth in this and it could move the market even more than we originally suspected. We decide not to abandon our view but to trade it a bit more conservatively this time around, but how could we do this?

Strangle

Related to a straddle is a strategy called a "strangle". A strangle shares many characteristics of the straddle but is a cheaper and more levered strategy. This is because it consists of out of the money options on the same underlying with the same expiration date. While this is cheaper, by definition it will require a greater move before it becomes profitable. This seems to fit our view well as we do not want the same expense that we lost on the straddle but think the news (and stock move) could be bigger than anyone previously expected. As such, we should benefit from the strategy requiring a large stock move to be profitable. As a side note, the origins of the name of this strategy are somewhat clouded and not entirely wholesome. Some people say the strategy acquired its name as the two out of the money strikes "strangle" the strike in between them. Others say it is because the profit and loss diagram resembles the shape someone's hands make when they are about to strangle someone! Regardless of how you remember it, though, let's take a closer look at how we could put this trade on.

As our view is that it will happen this month, we know we have to look again at front month options. As we weigh up the potential stock move from this event and the potential costs of options, we decide to purchase the 95% put and 105% call. Let's now analyze how this compares with our unsuccessful straddle. By being long the straddle, we see that we have unlimited profit potential should a movement occur but we need at least a 5% move in one direction before the strangle starts to become in the money — considerably more than our original straddle. However, our initial cost was considerably less as we bought out of the money options and our expectation is that the market will easily move 5% when this news breaks. All that is left for us now is to see if we will fare better this month and hopefully make back the money we lost on our straddle. Days pass and still no news materializes meaning that, once again, we are feeling the pain of losing money via time decay (or theta).

Suddenly, however, Alphabet announces a new product launch and shows that after extensive testing, it is now about to sell a self-driving car! The market is incredibly impressed and investors love it, sending the stock soaring more than 10%. We had to wait almost 3 months but finally, our patience pays off as our strangle becomes in the money. At expiry we decide that rather than sell our now in the money call, we will exercise it and enter a long stock position. I hope you are feeling good! Your views on Alphabet have been profitable and the bosses at Big Bucks Capital will be pleased with the savvy way that you have successfully negotiated the options market to produce a return far above that of the market.

Collar

After some aggressive trades, therefore, perhaps it is time to become a little more defensive and look at buying some insurance again. Earlier we bought an out of the money put but given the recent volatility in the market, these have become very expensive and we do not think it is a good investment to purchase

one outright. Given this, is there a way that we can cheapen this cost and still get some protection? Given the large rally in the stock price, we feel that there is a lack of further tailwinds to support this upward trajectory. Previously we traded a covered call to reflect this view, however, we are also aware that not much analysis has actually been undertaken on how good the driverless car will be. We are aware that one accident, for example, could erase all the gains we've just profited from. Meaning that we are now much more concerned about the downside. What if, therefore, we sold an upside call and took the proceeds from this and used it towards buying a downside put? If we did this, it would significantly cheapen buying a put outright and even though we are surrendering some upside potential, we should not be concerned with that given we don't expect the current stock rally to continue. This strategy would be called a Collar. Just like a strangle, the origins of the name of this strategy is somewhat debated. Some traders will claim it is because you are "collaring" your returns or because you have put a "collar" on the stock. Others claim it is because you have simultaneous positions in a cap (short an upside call) and a floor (long a downside put) and that a collar is something you wear between a cap and the floor! Again, how you remember it is not important, so long as you understand the concept behind this strategy.

Our view is that we would like to lock in the gains we have seen thus far by forgoing more than 5% of the upside for only incurring 5% of downside losses over the next month. We can use the "collar" function in OVME, in "products" and "option strategy", to price this up. By doing this, we see that rather than paying $8 for the protective put outright, we end up with a net debit of only $4. This is because we are halving the cost of the put by selling the call for $4. Looking at the scenario tab, it shows us how this payoff is graphed. This reduction in cost, therefore, makes this form of insurance much more palatable given the current level of volatility and skew. It is also worth noting that some traders may not structure their collar based on a performance analysis like we did. For example, if we had decided that premium was important, we could have structured it in a way that the premium received from a call could cover exactly the premium we pay for a specific put. This would have been called a "no cost" collar but would have had a different return profile given the different options we would have had to have transacted with.

With this position on, therefore, we can essentially relax and turn attention to other names we may want to add to our portfolio as we now know with certainty what our performance will be on Alphabet until the expiration of our collar. Once this has expired, though, your next trading strategy will be entirely down to you as you will be surely keen to start finding ways to use trading strategies to reflect your own market views!

Conclusion: Basic Multi-Leg Strategies

We have seen, therefore, that a multi-leg strategy is essentially any trade that involves more than one option. We have also successfully used them to lock in profits when the overall market direction is unclear but some volatility in price is expected. Multi-leg trades can also make it easier for us to plan for the costs associated with representing a view while simultaneously improving our risk management. As such, correct usage improves our prowess as a successful options trader.

Conclusion

We have seen, therefore, that equity options can be a powerful tool for traders. We have used them to speculate and make money and hedge to preserve gains and minimize losses. We've demonstrated that the leveraged nature of options can produce very powerful returns, often far in excess of what we could have received by trading only the underlying stock. It is important to remember, though, that while our time at Big Bucks Capital has been profitable, this has been due to our abilities to trade options well. Trading options, though, is not a guarantee that you'll always make money because they can also incur large losses. As a disciplined trader working for a well-managed financial institution, this is nothing you should worry about. However, history has shown us that when these criteria are not met, it can have catastrophic consequences.