

# Options I

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## **Using this study guide.**

This study guide is intended for use prior to attempting the accompanying exam. Read the complete study guide at your convenience before beginning the exam. You may cover the material in one session or break the material into several shorter sessions, whichever best fits your learning style. All answers to exam questions are covered in this document.

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## Options I

### Introduction

An option is really a contract that gives certain rights to the buyer, holder or owner of the contract. Option contracts must state the exact terms of the contract by specifying the type of option, the underlying security, the exercise price, the expiration month and the contract size.

The two types of options are call options and put options. Call options are options to buy whereas put options are options to sell. The underlying security for equity options is always common stock. Each contract is normally for 100 shares, but for stock dividends or stock splits, the size may be something different from 100 shares. The exercise price, or strike price, is the price at which the holder can exercise the option. In other words, the exercise price is the price at which the holder of a call may buy the stock or the owner of a put may sell the stock. The aggregate exercise price is calculated by multiplying the strike price times the number of shares in the contract. For XYZ FEB 50 Call, the aggregate exercise price is  $50 \times 100$  or \$5,000; for ABC MAR 45 Put, the aggregate exercise price is  $45 \times 100$  or \$4,500.

The option to buy or sell is finite since options have expiration dates. Thus a ABC MAY 60 Call would allow the owner to buy ABC stock at \$60 a share until it expires in May. The expiration date of all listed equity options is 10:59 PM Central time on Saturday, following the third Friday of the expiration month. However the last time an option can be traded is 3:02 PM Central time on the third Friday of the expiration month and the last time an option can be exercised is 4:30 PM Central time on the third Friday of the expiration month. The usual expiration cycle is the next two months in order and at any given time, there are four expiration dates from which to choose.

If the price of the underlying stock rises or falls significantly, the Exchange will issue new contracts at different intervals. If an option was introduced at 50 when the underlying stock price was 47 and the price moved to 50, the Exchange will probably introduce a new option at 55. Trading on the first options will continue and will not change in any way. If the price of the underlying stock drops to 45, the Exchange will probably introduce a new contract with an exercise price of 40. The Exchange will likely introduce new

options at new exercise prices for all applicable trading months other than those expiring during the current month.

Another name for market price of an option is premium. Premiums are quoted in dollars and fractions. Anytime the premium is \$3 or higher, the options are traded in increments of 1/8s. For options of less than \$3, increments of 1/16 may be used. To calculate the total cost of an option, multiply the premium times the contract (with contracts of normal size of 100 shares, each point is \$100). The usual way settlement of listed options trades is the next business day. That is, the premium is due from the buyer to the seller on the next business day.

The most important factor to affect option premiums is the relationship of the market price of the underlying stock to the exercise price of the option. This relationship determines whether or not the option is “in- or out-of-the-money.” Any option in-the-money has intrinsic value and the premium is almost always as high as or higher than its intrinsic value. In-the-money calls have market prices higher than the strike prices. In-the-money puts have market prices lower than the strike prices. Out-of-the-money calls have market prices lower than the strike prices. Out-of-the-money puts have market prices higher than the strike prices. The more time until an option expires, the greater the premium. Also the more volatile the stock, the higher the premium and conversely the less volatile stocks have lower premiums. In general, calls are worth more in bull markets and puts are worth more in bear markets

Any part of the premium above the intrinsic value is called the time value. Time value = premium less the intrinsic value. The premium of an out-of-the-money option is its time value only. The time value is greatest on options with the most time until the expiration date. An option is selling at parity when its premium is equal to its intrinsic value. “At parity” means the option premium has no time value. Options are most apt to sell at parity just before the expiration date.

A long position describes anyone who owns an option. A short position describes anyone who has written (sold) an option. All long and short options positions begin with an opening transaction and end with a closing transaction. An opening purchase transaction is one when an investor becomes the owner of an option and has a long position. An opening sale transaction is one when an investor becomes a seller of an option and has a short position. A closing purchase transaction is one in which the investor wants to buy an option with

exactly the same terms as an option he had previously sold, thus ending this obligation. That is, an investor with a short position closes his position. A closing sale transaction is one in which an investor wants to liquidate an existing long position by selling his option. An investor with a long position uses an opening purchase and a closing sale. An investor with a short position uses an opening sale and a closing purchase.

When the Options Clearing Corporation or OCC receives notice that an option has been exercised, it notifies a member firm who then sends notice of exercise to one of its customers whom has written an option of the same series. The only way the OCC can assign these notices is random, but the member firm may use random, FIFO, or any other fair method. However, assignment to the customer with the largest position is not considered fair. A call writer must deliver the underlying stock and accept the strike price. A put writer must accept delivery of the underlying stock and pay the strike price. Equity option exercise settlement is three business days after the option holder's tender of exercise notice by the OCC is received.

The OCC will automatically exercise all options that are ready to expire even if the holder doesn't exercise the option if the contract is at least  $\frac{3}{4}$  of a point in-the-money to a customer or  $\frac{1}{4}$  point in-the-money to a member.

## Call Option Strategies

A bullish option strategy is when the investor expects an increase in the market price of the underlying security. A bearish option strategy is when the investor expects a decrease in the market price of the underlying security. A neutral options strategy is when the investor expects the market price of the underlying security to remain about the same.

If an investor owns ABC FEB 55 Call, he has the right to buy 100 shares of ABC stock at the fixed price of \$55 per share anytime prior to the expiration date in February. If the price of ABC increases to more than \$55 just prior to the expiration date of this call, the investor could buy at the lower price of \$55 and sell at the higher price, thus realizing a profit. If, however, the price of ABC dropped below \$55, the investor would be more apt to let the option expire rather than exercise it.

The cost of buying an option is known as its premium and is stated on a per share basis. An option cost of 4 actually costs an investor  $\$4 \times 100$  or \$400 since the usual contract size is 100 shares. If the price of the underlying security increases from the time the option is bought to the time it is exercised, the client's profit potential is unlimited. If the investor chooses not to exercise the option, he may sell it and close his position. Hopefully, he would sell at a price higher than he bought it and realize a profit in the transaction.

Buying a call can be a good investment for investors who expect a rise in the cost of the underlying stock. If the current market price is greater than the strike price, the call is said to be in-the-money. If the current market price drops below the strike price, the call would be out-of-the-money. When buying a call option, the investor's maximum loss is the premium he paid.

The most bullish strategy is the long call position. It is very lucrative to the investor who thinks the underlying stock will rise in price and may be lucrative to the investor who is afraid of a rise in price. Buying an option in a security rather than buying the stock itself can tie up less of the investor's capital, thereby increasing his percentage of return. If an investor buys 100 shares of stock at \$40 per share and sells for \$50 per share, he made \$10 per share (not counting commissions) on an investment of \$40 per share. That is, he used \$4,000 to make \$1,000. His return was 25%. If, however, he had bought a 40 call option for the same security for 4, the picture looks quite

different. He invested 4 X 100 or \$400. He sold the option when the stock went up to \$50, so the option was 10 points in-the-money. He used \$400 to make a \$600 profit. His return was 150%. This illustrates the use of leverage with options.

In the same scenario, the above investor had \$4,000 at risk with his stock purchase, but only \$400 at risk with the options purchase. If the company had gone bankrupt, he could have lost all the \$4,000 with the stock purchase, but only \$400 with the options purchase. A call holder's maximum loss potential is the premium, but his profit potential is unlimited because there is no theoretical limit to how high a stock price can go.

Buying a call option can benefit an investor who is afraid of a rise in the price because anyone with a short position in the underlying stock can have a guaranteed way to buy back the stock at a set price. This would remove the unlimited risk potential from his short stock position. If Mr. White sells 100 share of XYZ short at 40 and simultaneously buys 1 XYZ Sept 45 call at 2, his maximum potential loss is  $\$45 - \$40$  (\$5) times 100 (\$500) plus  $\$2$  times 100 (\$200) or \$700.

Writing a call option obligates the writer to sell 100 shares of the specified stock to a call holder if and when the holder chooses to exercise the call. Call writing strategies are neutrally bearish because the writer of the call is counting on the expiration of the call rather than its exercise. If his obligation terminates before it is exercised, his profit is the premium. The option will likely go unexercised if the price of the stock stays the same or declines. Some call writing is covered and some is uncovered.

Short calls may be covered in several ways. If the writer of the option has a long position in the underlying stock, the short call is covered. The securities may be in the writer's account or in a bank account with an escrow receipt or a guarantee letter. A call may also be covered if the writer owns securities convertible into the underlying stock if the investor would have a sufficient number of shares after the conversion. Call writing is also considered covered if the writer has exercised rights or warrants on the underlying stock. Short call writing is also considered covered if the writer is long a call on the same security that has an expiration date that is as long or longer than that of the option sold and if the exercise price is the same or lower than that of the option sold. The reason this is considered a covered method is that the writer has a way to get the stock without having to buy it in the open market.

Covered call writers are interested in writing calls for the premium income and in protecting (or hedging) long stock positions. If an investor buys 100 shares of stock at \$40 per share and immediately writes a 40 call option on the stock for which he gets a premium of 3 points or \$300, he has decreased his cost basis to \$37 per share. He will not lose money unless the stock drops below \$37 per share. In this way, the investor has protected himself on the downside by the amount of the premium.

Anyone who writes a call without being covered is naked and has unlimited risk because 100 shares of stock must be delivered at the strike price. If the option is exercised, the writer would have to go out into the marketplace to buy the stock in order to make the delivery. The maximum loss is unlimited for a naked call writer, but the maximum earning is the amount of the premium.

The maximum profit for a covered call writer is calculated by comparing the original cost at the time of purchase to the sales proceeds (the strike price plus the premium). That is, a covered call writer's profit is the difference between the sales proceeds and the original cost. The maximum loss for a covered call writer is the original cost of the stock less the premium received. If Ms. Green buys 100 shares of UVW at \$40 per share and writes a UVW June 45 call at 5, her maximum profit is  $\$45 \times 100 (\$4500) + \$5 \times 100 (\$500)$  or  $\$5,000$  less  $\$40 \times 100 (\$4,000) = \$1,000$ . The sales proceeds are \$5,000 and the original cost is \$4,000, so the maximum profit is \$1,000. Ms. Green's maximum loss is the original cost of \$4,000 less the premium of \$500 or \$3,500.

## Put Option Strategies

An investor who buys a call option expects the market price of the security to increase above the fixed exercise price. An investor who buys a put option expects the opposite. That is, he will gain if the market price of the security decreases below the exercise price. If this happens, the investor will be able to sell the stock for more than its market price.

The most bearish strategy is buying a put option. This is done by investors who think the market price of the underlying security will decrease or those who are afraid the market price will decrease. Buying a put option offers the advantages of leverage and limited risk just as with the purchase of a call option. The put buyer is only at risk for his premium. If Mr. Brown buys 100 shares of GHI stock at \$45 per share and immediately buys one GHI Aug 42 put at 3, his maximum profit is unlimited. He bought the put as protection in the event the security decreased in price. If the stock drops all the way to zero, he can put the stock at 42 which would give him net proceeds of \$4,200 less the \$300 premium or \$3,900. Since he paid \$4,500 initially and received \$3,900, his maximum loss would be \$600.

If the strike price is the same as the cost of the stock, the maximum loss will always be the premium. The put option gives the holder of the option the right to sell 100 shares of the underlying stock at an exercise price anytime before the put expires on a pre-determined day in its expiration month. The investor pays the premium for this right. The value of a put option increases as the price of the underlying stock decreases below the strike price. Since the stock price has a limited downside potential, the profit potential for a put holder is also limited. If Ms. Blue buys an ABC Dec 35 put at 4, her profit potential is  $\$3500 - \$400$  or \$3100.

If the price of the ABC drops to 28, Ms. Blue still has the right to sell at \$7 higher than market price. This would raise the value of the put to well above the \$4 Ms. Blue paid for it and she could sell the put, close her position and realize a profit. In this way, Ms. Blue could profit without exercising the put. However, if she chose, she could exercise the put for \$35 at the same time she buys for \$28. Her profit would be  $\$3100 - \$2800 = \$300$ .

A put option can also be “insurance” for an investor who fears the price of the stock will decline. If an investor buys for \$35 per share and also buys a 35 put for a premium of 4, his put acts as a hedge against huge losses. If the

price drops to 28, he is protected because the put gives him the right to sell at \$35. His only loss would be the premium of  $4 \times 100$  or \$400. If the stock and the put are bought at the same time, the position is known as a married put. A put is in-the-money when the underlying stock price is less than the strike price.

A put buyer benefits if the market price of his underlying stock goes down. If the price drops all the way to zero, the put buyer's maximum profit will be the strike price less the premium. If Mr. Green buys a DEF Nov 36 put at 2, his maximum loss is the \$200 premium. If the stock goes down to zero, he has the right to buy at the market price of zero and sell at the \$3600 strike price. The \$3600 less the \$200 premium would give him a maximum profit of \$3400.

An investor who has a long position in the stock might be worried that the stock price will drop. He could protect himself by buying a put on the stock that would give him the right to sell the stock in the future at the strike price. The put writer is obligated to buy 100 shares at the strike price from the put owner if and when the holder chooses to exercise the put. The put writer receives the premium as payment for the obligation he accepts and for the risk he takes. If the put is exercised, the put writer has to have enough money to buy the stock that is worth less than he must pay for it. If Ms. Sims writes an ABC Dec 21 put for a premium of 3 and the put is exercised when ABC is 17, Ms. Sims must pay \$2100 for stock that is currently worth \$1700. Even with the \$300 premium, Ms. Sims will still lose \$100 ( $\$2100 - \$1700 = \$400 - \$300 = \$100$ ). The put writer didn't count on this happening; rather, the put writer expects the underlying security to increase or at least stay the same. If the stock in fact increases, the put owner will allow his put to expire rather than exercise it. In such a case, the writer's profit would be the premium. That is, the put writer's maximum profit is the premium he receives. Also, if the underlying stock drops all the way to zero, the maximum loss is the aggregate exercise price less the premium received. The maximum loss for the writer is the same as the maximum gain for the holder. If the writer loses, the holder gains; if the holder loses, the writer gains. This concept is referred to as zero-sum.

The put writer's strategy matches a neutrally bullish one because he will profit when the stock price remains the same or increases. He definitely hopes the stock doesn't go down and his put will be allowed to expire unexercised, thereby allowing him to earn only his premium.

A short put is covered only if the writer is also long a put of the same class with an equal or greater strike price. In this case, the writer is a covered put writer.

## Combinations and Straddles

Buying calls and writing puts are bullish strategies; buying puts and writing calls are bearish strategies.

When an investor buys a call and a put on the same underlying stock, the result is referred to as a long combination or a long straddle. If the call and put (both long or both short), are for the same underlying issue with different terms, such as Long ABC Mar 20 Call @ 2 and Long ABC Mar 22 Put @ 3, the position is a combination. A call and a put (both long or both short) on the same underlying issue with identical terms, such as Short ABC Oct 45 Call @ 4 and Short ABC Oct 45 Put @ 5, create a straddle.

The investor who buys a combination or a straddle expects some movement in the price of the underlying security at some point in the future. Because he is unsure whether the movement will be up or down, he buys options on both sides. He will have a profit as long as either side goes in-the-money for more than the sum of his two premiums.

The investor who writes the straddle or combination will gain if there is little or no movement in the underlying security. The writer will realize a profit if neither option moves in-the-money for an amount as great as the sum of the two premiums. The maximum potential loss for a long straddle or long combination is the amount of the premiums because both consist of a long call and a long put. The maximum potential gain is the combined profit of the two options. Because one is a long call, the maximum potential gain is unlimited.

With a short straddle or short combination, because there is a put and a call, the maximum potential profit is the combined premiums. The maximum potential loss is unlimited because one of the options is a short call.

## Spreads

Spread is the purchase and sell of options of the same class with different expiration months or with different exercise prices such as Long ABC Nov 55 Call and Short ABC Dec 55 Call. A vertical or price spread is when the expiration months are the same and the prices are different. A horizontal or time or calendar spread is when the expiration months are different and the prices are the same. In the case of spreads, there is something different about the two options.

A debit spread is when the option being bought costs more than the one being sold and the broker is owed money. A credit spread is when the option being sold costs more than the one being bought and the broker or dealer has to credit the net proceeds to the customer's account. Here is a price debit spread: Buy ABC Oct 75 Call for 7 and Sell ABC Oct 80 Call for 5. Since the customer will have to pay 7 and receive 5, the broker is owed 2, thereby qualifying this as a debit spread. Here is a price credit spread: Buy an XYZ Feb 50 Call for 2 and Sell an XYZ Feb 55 Call for 3½. Since the customer will receive 3½ and only pay 2, the net proceeds to the customer will be 1½, thereby qualifying as a credit spread.

If Mrs. Johnson buys one DEF Nov 25 call at 4 and sells one DEF Nov 30 at 2, her maximum potential loss is the net premium or debit of \$400- \$200 or \$200. Her maximum potential gain is the difference between the two strike prices of  $30 - 25 = 5$  (\$500) less the debit of \$200 or \$300.

If Mr. Johnson buys one PQR Jan 56 call 2½ and sells one PQR Jan 46 call at 7, his maximum potential gain is the credit of  $7 - 2½ = 4½$  or \$450. The maximum potential loss is the difference between the two strike prices ( $56 - 46 = 10$ ) less the credit or  $\$1000 - \$450 = \$550$ .

With a debit spread, a short put is covered if the writer is long a put at the same or higher striking price. This is one reason the maximum potential loss is limited. Another reason is that the writer can always exercise his long call to acquire the stock needed to deliver against being exercised on the short. With a credit spread, each dollar of loss on the short call will be offset by a dollar of gain on the long call if the stock increases above the striking price. With the put spread, each dollar of loss on the short put will be offset by a dollar of gain on the long put when the market price drops below the striking price. If the

spread is a debit spread, the investor will benefit if the difference in the premiums widens and the options are exercised. If the spread is a credit spread, the investor will benefit if the difference in premiums narrows and the options are unexercised.

Vertical or price spreads may be bullish or bearish. The spread is identified as one or the other by comparing the strike price of the long option to the strike price of the short option. Buying low and selling high is a bull spread. Buying high and selling low is a bear spread.

On the expiration date all options sell for their intrinsic value. If Mr. Smith buys one RST Aug 75 call at  $6\frac{1}{2}$  and sells one RST Aug 80 call at  $5\frac{1}{2}$ , and the RST is at 78 on the expiration date, he will make a profit of \$200. The current market value is 78, so the 75 is worth 3 points and the 80 is worth zero. Mr. Smith will close his 75 call by selling it for 3 and let the 80 expire worthless, which means it cost him nothing to close-out his short position.

If an investor feels neither bearish nor bullish about the market, he may participate in a neutral spread. Time spreads, which are also called calendar or horizontal spreads, are neutral. These spreads sell the near expiration and buy the far. If Miss Mays sells one XYZ Aug 55 put @  $4\frac{1}{2}$  and buys one XYZ Nov 55 put @  $7\frac{1}{4}$ , she expects the market price of the underlying stock to remain about the same. If the market price just before the August expiration date is 55, the option would have no intrinsic value and no time value. The Nov 55 also would have no intrinsic value, but Miss Mays is hoping that the time value will be more than the  $2\frac{3}{4}$  that she initially paid for the spread.

## Breakeven Points

Breakeven is the price of the underlying stock at which the option investor neither gains nor loses, but breaks even. Breakeven points are based on the “Call-up and Put-down” rule. The Call-up rule says for long or short calls: Add the premium to the strike price and for call spreads: Add the debit or credit to the lower strike price (UP from the bottom). The Put-down rule says for long or short puts: Subtract the premium from the strike price and for put spreads: Subtract debit or credit from the higher strike price (Down from the top). Short PQR Nov 45 call @ 5 has a breakeven point of 50. Long PQR Nov 45 put @ 5 has a breakeven point of 40.

The call-up and put-down rule has two breakeven points for a straddle or a combination: Add the sum of the premiums to the call strike price and subtract the sum of the premiums from the put strike price. For a long straddle or combination, an investor realizes a profit if the market price moves outside and for a short straddle or combination, an investor realizes a profit if the market price stays inside the breakeven. For a straddle of IJK Dec 58 Call @ 6 and IJK Dec 58 Put @ 4½, the total premium is 10½, so as long as the market price stays between 68½ (58 + 10½) and 47½ (58 – 10½), the writer will profit. If the market price goes above 68½ or below 47½, the buyer will profit. For a combination of KJS Nov 42 Call @ 3 and KJS Nov 47 Put @ 2, the total premium is 5, so as long as the market price stays between 47 (42 + 5) and 42 (47 - 5), the writer will profit. If the market price goes above 47 or below 42, the buyer will profit.

If Mr. Smith buys one ABC Dec 25 call @ 3 and sells one ABC Dec 30 call @ 1, his breakeven is \$27 because the call-up rule says to add 2 points net premium to the 25 strike. If Mrs. Smith buys one ABC Dec 25 put @ 1 and sells one ABC Dec 30 put @ 3, her breakeven is \$28, because the put-down rule says to subtract 2 points net premium from the 30 strike price.

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Now that you have completed reading this course, you may proceed to the accompanying exam to earn a verifiable certificate of completion.