# RiskMgt2.docx Managing risk with options contracts

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## Part DS Options

### DS12 Call option is in- or out-of-the-money (TRUE / FALSE)

Is this statement true or false? “A call option has a strike of $50.00 and the underlying stock price is $41.30 so the option is out-of-the-money.”

{ANSWER: A ; xlADDRESS: Options!$B$40 }

/\a. True b. False

### DS13 Put option is in- or out-of-the-money (TRUE / FALSE)

Is this statement true or false? “A put option has a strike of $42.50 and the underlying stock price is $36.00 so the option is in-the-money.”

{ANSWER: A ; xlADDRESS: Options!$B$48 }

/\a. True b. False

### DS14 OR(Put,Call) is in- or out-of-the-money (TRUE / FALSE)

Is this statement true or false? “A put option has a strike of $35.00 and the underlying stock price is $29.15 so the option is in-the-money.”

{ANSWER: A ; xlADDRESS: Options!$B$57 }

/\a. True b. False

### DS15 executive stock options are OR(calls, puts)

Stocks options given to executives as supplemental compensation probably are put options.

{ANSWER: B ; xlADDRESS: Options!$B$63 }

/\a. True b. False

### DS16 Match the options profit profile (long call, short call, long put)

Which statement correctly describes the respective stock option profit profile?



{ANSWER: E ; xlADDRESS: Options!$B$72 }

/\a. line XX is a profit profile for a long call option position

/\b. line YY is a profit profile for a short call option position

/\c. line ZZ is a profit profile for a long put option position

/\d. Two choices, A and B, are correct

/\e. The three A-B-C choices are all correct

### DS25 Match the options profit profile (long call, long put, straddle)

Which statement correctly describes the respective stock option profit profile?



{ANSWER: A ; xlADDRESS: Options!$B$463 }

/\a. line XX is a profit profile for a long put option position

/\b. line YY is a profit profile for a collar position

/\c. line ZZ is a profit profile for a short call option position

/\d. Two choices, B and C, are correct

/\e. None of the A-B-C choices are correct

### DS18 Identify an arbitrage opportunity given strike and stock price

A stock trades at a price of $16.00 per share. An option with strike of $20.00 also trades. Which statement describes existence of an arbitrage opportunity?

{ANSWER: D ; xlADDRESS: Options!$B$92 }

/\a. an arbitrage exists if there exists a call option with price of $3.60

/\b. an arbitrage exists if there exists a put option with price of $3.20

/\c. an arbitrage exists if there exists a put option with price of $2.80

/\d. Two choices, B and C, are correct

/\e. None of the A-B-C choices are correct

### DS10 find arbitrage profit for call option

A common stock has a current share price of $25.90 . A call option on the stock with strike of $17.50 has an option price of $5.00 . How much is the arbitrage profit?

{ANSWER: C ; xlADDRESS: Options!$B$15 }

/\a. $1.90 b. $2.20 c. $3.40 d. $2.60 e. $3.00

### DS1a Find type and option price given intrinsic value that provides arb profit

Company shares have a current market price of $79.30 . An option on the shares has a strike of $75 . Which option below provides the greatest amount of arbitrage profit?

{ANSWER: C ; xlADDRESS: Options!$B$281 ; CLUES: intrinsic value = $4.30 }

/\a. a put option with a price of $4.13

/\b. a call option with a price of $4.54

/\c. a call option with a price of $3.75

/\d. a call option with a price of $4.13

/\e. a put option with a price of $3.75

### DS1b Find type and option price given AND(intrinsic value, time value) that provides arb profit

Company shares have a current market price of $79.30 . An option on the shares has a strike of $75 and a time value of $1.80 . Which option below provides the greatest amount of arbitrage profit?

{ANSWER: E ; xlADDRESS: Options!$B$289 ; CLUES: intrinsic value = $4.30 }

/\a. a call option with a price of $6.36

/\b. a put option with a price of $5.78

/\c. a put option with a price of $6.36

/\d. a put option with a price of $5.26

/\e. a call option with a price of $5.26

### DS2a Find ROR on speculative call investment given option price, shareprice, and % change in shareprice

Company shares have a current market price of $47.50 . A call option on the shares has a strike of $45 and a price of $3.50 . If at expiry the percentage change in shareprice is 10%, what is the rate of return on the speculative call option investment?

{ANSWER: B ; xlADDRESS: Options!$B$307 ; CLUES: option payoff = $7.25 }

/\a. 97.4% b. 107.1% c. 73.2% d. 88.5% e. 80.5%

### DS2b Find ROR on speculative call investment given option time value, shareprice, and % change in shareprice

Company shares have a current market price of $47.50 . A call option on the shares has a strike of $45 and a time value of $1.00 . If at expiry the percentage change in shareprice is 10%, what is the rate of return on the speculative call option investment?

{ANSWER: B ; xlADDRESS: Options!$B$307 ; CLUES: option payoff = $7.25 }

/\a. 97.4% b. 107.1% c. 73.2% d. 88.5% e. 80.5%

### DS2c Find ROR on speculative put investment given option price, shareprice, and % change in shareprice

Company shares have a current market price of $42.50 . A put option on the shares has a strike of $45 and a price of $9.70 . If at expiry the percentage change in shareprice is 10%, what is the rate of return on the speculative put option investment?

{ANSWER: C ; xlADDRESS: Options!$F$307 ; CLUES: option payoff = $0.00 }

/\a. -90.9% b. -121.0% c. -100.0% d. -82.6% e. -110.0%

### DS2d Find ROR on speculative put investment given option time value, shareprice, and % change in shareprice

Company shares have a current market price of $42.50 . A put option on the shares has a strike of $45 and a time value of $7.20 . If at expiry the percentage change in shareprice is 10%, what is the rate of return on the speculative put option investment?

{ANSWER: C ; xlADDRESS: Options!$F$307 ; CLUES: option payoff = $0.00 }

/\a. -90.9% b. -121.0% c. -100.0% d. -82.6% e. -110.0%

### DS2e Find ROR on speculative OR(call,put) investment given option price, shareprice, and % change in shareprice

Company shares have a current market price of $42.50 . A put option on the shares has a strike of $45 and a price of $9.70 . If at expiry the percentage change in shareprice is 10%, what is the rate of return on the speculative put option investment?

{ANSWER: B ; xlADDRESS: Options!$J$307 ; CLUES: option payoff = **Error! Not a valid link.** }

/\a. -82.6% b. -100.0% c. -121.0% d. -90.9% e. -110.0%

### DS2f Find ROR on speculative OR(call,put) investment given option time value, shareprice, and % change in shareprice

Company shares have a current market price of $42.50 . A put option on the shares has a strike of $45 and a time value of $7.20 . If at expiry the percentage change in shareprice is 10%, what is the rate of return on the speculative put option investment?

{ANSWER: B ; xlADDRESS: Options!$J$307 ; CLUES: option payoff = $0.00 }

/\a. -82.6% b. -100.0% c. -121.0% d. -90.9% e. -110.0%

### DS2g Find ROR on speculative OR(call,put) investment given option OR(price, time value), shareprice, and % change in shareprice

Company shares have a current market price of $42.50 . A put option on the shares has a strike of $45 and a option price of $9.70 . If at expiry the percentage change in shareprice is 10%, what is the rate of return on the speculative put option investment?

{ANSWER: B ; xlADDRESS: Options!$J$307 ; CLUES: option payoff = $0.00 }

/\a. -82.6% b. -100.0% c. -121.0% d. -90.9% e. -110.0%

### DS3a Find shareprice such that ROR on speculative OR(call,put) is zero

Suppose a put option with strike of 40 costs $5.00 If at expiry it returns a payoff such that the profit is zero, what is the underlying stock price at expiry?

{ANSWER: B ; xlADDRESS: Options!$B$322 }

/\a. $23.91 b. $35.00 c. $31.82 d. $26.30 e. $28.93

### DS3b Find shareprice such that ROR on speculative OR(call,put) is x%

Suppose a put option with strike of 40 costs $5.00 . If at expiry it returns a payoff such that the rate of return on the option investment is 40%, what is the underlying stock price at expiry?

{ANSWER: D ; xlADDRESS: Options!$F$322 }

/\a. $30.00 b. $39.93 c. $36.30 d. $33.00 e. $27.27

### DS11 find underlying asset price at expiry giving specified ror

A call option with strike of $27.50 has a current option price of $1.75 . Suppose you make a speculative investment in the call with the expectation that your rate of return will equal 40%. What price at expiry do you expect for the underlying asset?

{ANSWER: A ; xlADDRESS: Options!$B$28 ; CLUE: payoff = $2.45 }

/\a. $29.95 b. $22.50 c. $27.23 d. $32.95 e. $24.75

### DS24 commodity option profit per contract

Your company purchases a call option on Corn in order to hedge its production costs. The quote for the option looks like this:

CORN 5,000 bushels; cents per bushel

strike call last

210 2.80

The spot price of corn at expiry is $2.60 per bushel and the option price converged to its intrinsic value. How much money did this strategy save your company?

{ANSWER: E ; xlADDRESS: Options!$B$454 }

/\a. $1,773 b. $1,612 c. $2,145 d. $1,950 e. $2,360

*Multiple setup (DS6m)*

You have $10,000 to invest in Company shares that currently trade at $38.70 . You choose to invest 5% of your funds in long-term call options with a strike of 45 that currently are quoted at $0.85 . The options expire in 22 months. The other funds will be placed into a money market earning 5.5% compounded monthly.

{xlADDRESS: Options!R330C1 ; CLUES: FV(MM)=$10,505 , payoff(option)= $4,034 }

### DS6am Call option portfolio insurance, find outcome given percent change in shareprice

What is the rate of return for the holding period on the total investment position if the shareprice is up 34% at expiry?

{ANSWER: A ; xlADDRESS: Options!$B$342 }

/\a. 45% b. 34% c. 41% d. 38% e. 31%

### DS6bm Call option portfolio insurance, find worst case outcome

What is the rate of return for the holding period in the worst-case outcome?

{ANSWER: C ; xlADDRESS: Options!$F$342 }

/\a. 4.2% b. 3.8% c. 5.1% d. 4.6% e. 3.5%

### DS17a Call option insurance ending wealth when given maximum loss

The shareprice of Company stock currently is $22.35 . You have $13,000 available for investing in the good fortunes of the Company. Instead of buying the stock, however, you pursue a portfolio insurance strategy that invests in a money market account earning 4.80% compounded monthly. Also, you invest in call options on the Company stock with a strike of $27.50 and option price of $4.80 (assume you can buy fractions of options). Your allocation assures you that, even in a worst-case scenario, you will not lose more than $3,000 of your original principal. Suppose that at the conclusion of your 17 month investment horizon the Company stock has risen 60%. Find the ending wealth for the investment strategy.

{ANSWER: D ; xlADDRESS: Options!$B$109; CLUES: money mkt = $9,344 , #calls = 762 }

/\a. $21,684 b. $19,713 c. $17,921 d. $16,292 e. $23,853

### DS17b Call option insurance ROR when given maximum loss

The shareprice of Company stock currently is $22.35 . You have $13,000 available for investing in the good fortunes of the Company. Instead of buying the stock, however, you pursue a portfolio insurance strategy that invests in a money market account earning 4.80% compounded monthly. Also, you invest in call options on the Company stock with a strike of $27.50 and option price of $4.80 (assume you can buy fractions of options). Your allocation assures you that, even in a worst-case scenario, you will not lose more than $3,000 of your original principal. Suppose that at the conclusion of your 17 month investment horizon the Company stock has risen 60%. Find the cumulative rate of return for the investment strategy.

{ANSWER: B ; xlADDRESS: Options!$F$109 CLUES: money mkt = $9,344 , #calls = 762 }

/\a. 33.7% b. 25.3% c. 27.9% d. 30.6% e. 23.0%

### DS19a Buy-and-write ROR given stock price change

Many individual investors employ a “buy-and-write” investment strategy that involves a long stock position and short call position. You implement the strategy by buying a stock at price $21.65 and writing a call with strike of $27.50 and option price of $4.20 . In one year you receive the stock’s annual dividend of $1.75 and, furthermore, suppose the stock price has increased 22%. Find the rate of return for this buy-and-write strategy.

{ANSWER: E ; xlADDRESS: Options!$B$124 }

/\a. 50.7% b. 55.8% c. 74.3% d. 67.5% e. 61.4%

### DS19b Buy-and-write ROR enhancement relative to stock price change

Many individual investors employ a “buy-and-write” investment strategy that involves a long stock position and short call position. You implement the strategy by buying a stock at price $21.65 and writing a call with strike of $27.50 and option price of $4.20 . In one year you receive the stock’s annual dividend of $1.75 and, furthermore, suppose the stock price has increased 22%. Find the amount by which the rate of return for this buy-and-write strategy exceeds the rate of return for the stock-only strategy.

{ANSWER: C ; xlADDRESS: Options!$F$124 }

/\a. 45.8% b. 37.9% c. 31.3% d. 34.4% e. 41.7%

### DS23 Buy-and-write maximum ROR

Many individual investors employ a “buy-and-write” investment strategy that involves a long stock position and short call position. You implement the strategy by buying a stock at price $20.35 and writing a call with strike of $25.00 and option price of $2.70 . In one year you receive the stock’s annual dividend of $2.05 . Find the maximum rate of return that this strategy can possibly earn for you.

{ANSWER: A ; xlADDRESS: Options!$B$440 }

/\a. 53.3% b. 64.4% c. 44.0% d. 48.4% e. 58.6%

*Multiple setup (DS4m)*

You buy 1 share of stock at $79.80 and also purchase one put option with strike of $80.00 and time value of $7.90 .

{xlADDRESS: Option!R350C1 ; CLUES: option price= $8.10 ; W0= $87.90 }

### DS4am Find ROR on put insurance position given %change shareprice and option OR(time value,price)

Suppose the percentage change in stock price at expiry is -10%. What is the overall rate of return on your position?

{ANSWER: D ; xlADDRESS: Options!$B$361 }

/\a. -9.9% b. -13.2% c. -12.0% d. -9.0% e. -10.9%

### DS4bm Find worst-case outcome on put insurance position given option OR(time value, price)

What is the overall rate of return on your position for the worst-case outcome?

{ANSWER: C ; xlADDRESS: Options!$F$361 }

/\a. -7.4% b. -8.2% c. -9.0% d. -6.8% e. -6.1%

### DS4cm Find shareprice such that ROR on put insurance position is x% given OR(time value, option price)

What is the stock price at expiry that would cause your overall rate of return on the position to equal -10%?

{ANSWER: D ; xlADDRESS: Options!$J$361 }

/\a. $66.12 b. $72.73 c. $54.64 d. $80.00 e. $60.11

### DS20 Find ROR on put insurance position given % change in shareprice

You buy 1 share of stock at $27.20 and also purchase one put option with strike of $22.50 and option price of $4.70 . What is the overall rate of return on your position if the percentage change in stock price at expiry is -19%?

{ANSWER: D ; xlADDRESS: Options!$B$138 }

/\a. -24.4% b. -22.1% c. -20.1% d. -29.5% e. -26.8%

### DS21 Find worst-case outcome on put insurance position

You buy 1 share of stock at $60.00 and also purchase one put option with strike of $50.00 and option price of $4.20 . What is the overall rate of return on your position for the worst-case outcome?

{ANSWER: D ; xlADDRESS: Options!$B$151 }

/\a. -26.8% b. -29.4% c. -32.4% d. -22.1% e. -24.3%

### DS22 Find shareprice such that ROR on put insurance position is x%

You buy 1 share of stock at $54.90 and also purchase one put option with strike of $45.00 and option price of $4.20 . What is the stock price at expiry such that your overall rate of return on the position (“ROR”) is 22%?

{ANSWER: C ; xlADDRESS: Options!$B$165 }

/\a. $65.55 b. $95.97 c. $72.10 d. $79.31 e. it's impossible to get this ROR

### DS5a Find ROR on a speculative currency options

You buy a put option on 4,000 sucres with a strike of 1.20 USD for a price of 0.0300 USD per sucre. At expiry, the spot exchange rate is 1 sucre = 1.39 USD and you cash in the options at their payoff value (if any). What is the rate of return from this speculative transaction?

{ANSWER: E ; xlADDRESS: Options!$B$378 ; CLUES: payoff on options = $0 }

/\a. -110% b. -91% c. -121% d. -133% e. -100%

### DS5b Find net cost/revenue of using currency options on a hedge

Today is Jan. 2, 2525, and the Company plans to exchange 4,000 sucre with its international subsidiary in 3 months. A put option on sucres with a strike of 1.20 USD and expiry in 3 months costs 0.0300 USD per sucre. The Company buys put options on 4,000 sucres. In 3 months, just prior to expiration of the options, the spot exchange rate is 1 sucre = 1.39 USD . The Company cashes in the options at their payoff value and sells 4,000 sucres at the spot exchange rate. What is the net revenue in USD of exchanging the sucres?

{ANSWER: E ; xlADDRESS: Options!$F$378 ; CLUES: payoff on options = $0 }

/\a. $7,241 b. $7,965 c. $6,582 d. $5,984 e. $5,440

### DS5c Find net benefit and strategy of currency options hedge

Today is Jan. 2, 2525, and the Company expects to receive from an international subsidiary 4,000 sucre in 3 months. The Company intends to exchange the sucre at the local bank. The Company nonetheless intends to buy appropriate currency options contracts and, in three months, will close the options position for cash. The cash flows from the options transaction will hedge movements in exchange rates at the local bank. An appropriate option on sucres with a strike of 1.20 USD per sucre costs 0.0300 USD per sucre. The Company buys appropriate options on 4,000 sucres. In 3 months, just prior to expiration of the options, the spot exchange rate at the local bank is 1 sucre = 1.39 USD . The Company cashes in the options at their payoff value and sells 4,000 sucres at the spot exchange rate. Which statement about this hedging activity is correct?

{ANSWER: C ; xlADDRESS: Options!$J$378 ; CLUES: payoff on options = $0 }

/\a. the Company buys put options and the hedge eventually costs them $159

/\b. the Company buys call options and the hedge eventually saves them $159

/\c. the Company buys put options and the hedge eventually costs them $120

/\d. the Company buys put options and the hedge eventually costs them $138

/\e. the Company buys call options and the hedge eventually saves them $120

### DS7a Put/Call Straddle, find the rate of return given the ending shareprice

The shareprice of Company stock currently is $54.00 . Due to a pending court case, there is a lot of uncertainty about the Company and, consequently, you believe the shareprice might either rise a lot or fall a lot. You do not buy the share. Instead, you buy one call option that costs $9.55 and you buy one put option that costs $1.25 . For both options, the strike is 45. At expiry, the Company shareprice is $52.20 . What is your overall rate of return from investment in the options?

{ANSWER: B ; xlADDRESS: Options!$B$395 ; CLUES: payoff on call = $7.20 ; payoff on put = $0.00 }

/\a. -48.8% b. -33.3% c. -36.7% d. -40.3% e. -44.4%

### DS7b Put/Call Straddle, find the breakeven shareprices

The shareprice of Company stock currently is $54.00 . Due to a pending court case, there is a lot of uncertainty about the Company and, consequently, you believe the shareprice might either rise a lot or fall a lot. You do not buy the share. Instead, you buy one call option that costs $9.55 and you buy one put option that costs $1.25 . For both options, the strike is 45. Which statement about the Company shareprice at expiry is true such that your overall rate of return from investment in the options is exactly zero?

{ANSWER: B ; xlADDRESS: Options!$F$395 }

/\a. if the shareprice is $42.19 then profit on the put exactly offsets losses on the call

/\b. if the shareprice is $55.80 then profit on the call exactly offsets losses on the put

/\c. if the shareprice is $48.52 then profit on the put exactly offsets losses on the call

/\d. if the shareprice is $55.80 then profit on the put exactly offsets losses on the call

/\e. if the shareprice is $42.19 then profit on the call exactly offsets losses on the put

### DS7c Put/Call Straddle, find the shareprices at which ror is x%

The shareprice of Company stock currently is $54.00 . Due to a pending court case, there is a lot of uncertainty about the Company and, consequently, you believe the shareprice might either rise a lot or fall a lot. You do not buy the share. Instead, you buy one call option that costs $9.55 and you buy one put option that costs $1.25 . For both options, the strike is 45. Which statement about the Company shareprice at expiry is true such that your investment in the options attains a 40% target overall rate of return?

{ANSWER: C ; xlADDRESS: Options!$J$395 }

/\a. if the shareprice is $29.88 then call profits exceed put losses and you hit the target

/\b. if the shareprice is $34.36 then put profits exceed call losses and you hit the target

/\c. if the shareprice is $29.88 then put profits exceed call losses and you hit the target

/\d. if the shareprice is $25.98 then call profits exceed put losses and you hit the target

/\e. if the shareprice is $25.98 then put profits exceed call losses and you hit the target

### DS8 Straddle description of outcomes

The Company uses a lot of oil in their production process. Due to the unique nature of their contracts, they hedge oil price movements by entering long straddle positions (long call and long put). Currently the spot price of crude oil is $18.00 . For options with a strike of 15 the call price is $4.45 and put price is $0.50 . Choose the most accurate statement about outcomes.

{ANSWER: D ; xlADDRESS: Options!$B$410 }

/\a. The straddle makes money whenever the price of crude at expiry exceeds $10.05

/\b. When the price of crude at expiry exceeds $19.95 losses from the call exceed the gains from the put

/\c. The only way the straddle loses money is if the price of crude at expiry is between $10.05 and $17.05

/\d. The straddle makes money whenever the price of crude at expiry is less than $10.05

/\e. When the price of crude at expiry is less than $10.05 then the losses from the put exceed the gains from the call

### DS26 Find currency straddle characteristics

The Company has many contracts denominated in sucres. Each option contract insures the currency exchange rate between 100,000 sucres and the USD. The Company hedges against adverse exchange rate movements by entering a long straddle position (long call and long put) on the sucre. The quotes (in U.S. cents) on option contracts list the following:

*strike* = 101.40 cents

*call last price* = 1.30 cents

*put last price* = 0.50 cents

Which statement about the straddle is most accurate?

{ANSWER: B ; xlADDRESS: Options!$B$478; CLUES: cost of straddle per sucre = $0.018 }

/\a. The initial cost of entering the straddle is $1400

/\b. When price of the sucre at expiry is less than $0.996 then payoff on the put makes the straddle profitable.

/\c. When price of the sucre at expiry is greater than $0.929 then payoff on the call makes the straddle profitable.

/\d. Two choices, A and B, are correct

/\e. None of the A-B-C choices are correct

### DS9 Valuation effects of collar

You have accumulated 1,300 shares of company stock because of a generous employee stock ownership plan. Today’s share price is $52.50 . You use a collar to lock-in the value 8 months from now of today’s stock holdings. The collar takes a long position on 1,300 put options with strike of 60 and per unit option price of $11.00 . Also you take a short position on 1,300 call options with strike of 70 and per unit option price of $4.00 . Which is the most accurate statement about the valuation effects of the collar?

{ANSWER: C ; xlADDRESS: Options!$B$426 }

/\a. The best-case outcome is that in 8 months the stocks become worth $78000

/\b. The worst-case outcome is that in 8 months the stocks become worth $91000

/\c. The initial cash flow from entering the collar today is a cash outflow of $9100

/\d. Two choices, A and B, are correct

/\e. The three A-B-C choices are all correct

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