

EXTRA EXERCISES

King Saud University
Mathematics Department | ACTU461
Exercise's Lecture (9)
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The current stock price of a non-dividend paying stock is 50. The continuously compounded annual risk-free interest rate is 4%. A 45-strike European call option on the stock with 6 months to expiration has price 6.75. The stock pays no dividends. What price must the stock be in 6 months so that buying the call and selling the call have the same profit?

Which of the following do not have unlimited loss potential from adverse price movement in the underlying asset?

- A) Long forward contract
- B) Short call option
- C) Short forward contract
- D) Short sale

The current stock price of a non-dividend paying stock is 50. The continuously compounded annual risk-free interest rate is 4%. The following table shows the value 6-months European calls on the stock.

Strike Price K	Call Premium
45	6.57
50	3.31
55	1.38

All the calls are purchased calls. At what stock price range does the 45-strike call produce a higher profit than the 50-strike call but a lower profit than the 55-strike call?

PAST EXAMS

Near market closing time on given day the European call prices for a stock are available as follows:

Strike Price	Call Price
40	11
50	6
55	3

The options have expiration time $t=0.05$. The continuously compounded annual interest rate is $r=0.04$

Mary construct the following portfolio: Long two calls options with strike price 40, short six call options with strike price 50; Lend 2\$; and long some calls with strike price 55.

The \$2 she lends is obtained from the sale and purchase of the options
What is her profit at $T=0.5$ if the price of the stock is 52 at that time?

The current price of a non-dividend paying stock is 30. The continuously compounded risk-free rate is .03. The premium for a 6-month 31-strike put option is 1.99, and the premium for a 6-month 34 strike put option is 4.05. You sell 2 of the 31-strike puts and buy 3 of the 34-strike puts. What is the maximum profit and loss for the combined position at maturity?

	Maximum	Minimum
A)	Unlimited	-8.29
B)	Unlimited	-8.17
C)	8.29	Unlimited
D)	31.79	Unlimited
E)	31.79	-8.29

A trader shorts one share of a stock index for 50 and buys a 60-strike European call option on that stock that expires in 2 years for 10. Assume the annual effective risk-free interest rate is 3%. The stock index increases to 75 after 2 years. Calculate the profit on your combined position.

The current price of a forward of corn is 3.3 per bushel. The annual effective interest rate is 7.5%. The price of a one year European 3.5-strike put option for corn is 0.18 per bushel. Find an arbitrage strategy and its minimum profit per bushel.

The current price of a stock that pays no dividends is 40. The continuously compounded risk-free rate is 4%. Investor A buys a six month 41-Strike put for 3.48. Investor B enters into a six month short forward contract to sell that stock for the forward price 40.81. At what stock price do the two investors have the same profit in six months

Consider two European call options on a stock with expiration date exactly one year from now and the same nominal amount. The risk-free effective annual interest rate is 5%. Suppose that one call option has a strike price 30 and priced at 4 and the other one has a strike price 40 and priced at 7. Find an arbitrage portfolio and its minimum profit