Chapter 1. Introduction 총 34문제

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Selling a call option and buying a put option (11)

Forward/futures contracts (12,13,25,30)
Put options (14,20,22,33,38,16,34)
Call options (21,19)

Stock vs. call (15,35)

Forward vs. call (37)

Decide what you have to do (23,24,39)
Discussions (17,18,26,27,32)

Find the arbitrage opportunities (31,36,41)

Advanced topics (28,29,40,42,43,44)

Selling a call option and buying a put option (11)

1.11. Explain carefully the difference between selling a call option and buying a put option.

Forward/futures contracts (12,13,25,30)

1.12. An investor enters into a short forward contract to sell 100,000 British pounds for U.S. dollars at an exchange rate of 1.3000 USD per pound. How much does the investor gain or lose if the exchange rate at the end of the contract is (a) 1.2900 and (b) 1.3200?

Forward/futures contracts (12,13,25,30)

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1.13. A trader enters into a short cotton futures contract when the futures price is 50 cents per pound. The contract is for the delivery of 50,000 pounds. How much does the trader gain or lose if the cotton price at the end of the contract is (a) 48.20 cents per pound and (b) 51.30 cents per pound?

Forward/futures contracts (12,13,25,30)

1.25. A trader enters into a short forward contract on 100 million yen. The forward exchange rate is $0.0090 per yen. How much does the trader gain or lose if the exchange rate at the end of the contract is (a) $0.0084 per yen and (b) $0.0101 per yen?

Forward/futures contracts (12,13,25,30)

1.30. On July 1, 2021, a company enters into a forward contract to buy 10 million Japanese yen on January 1, 2022. On September 1, 2021, it enters into a forward contract to sell 10 million Japanese yen on January 1, 2022. Describe the payoff from this strategy.

Put options (14,20,22,33,38,16,34)

1.14. Suppose that you write a put contract with a strike price of $40 and an expiration date in 3 months. The current stock price is $41, and the contract is on 100 shares. What have you committed yourself to? How much could you gain or lose?

Put options (14,20,22,33,38,16,34)

1.20. Suppose that a June put option to sell a share for $60 costs $4 and is held until June. Under what circumstances will the seller of the option (i.e., the party with the short position) make a profit? Under what circumstances will the option be exercised? Draw a diagram illustrating how the profit from a short position in the option depends on the stock price at the maturity of the option.

Put options (14,20,22,33,38,16,34)

1.22. A trader writes a December put option with a strike price of $30. The price of the option is $4. Under what circumstances does the trader make a gain?

Put options (14,20,22,33,38,16,34)

1.33. A trader sells a put option with a strike price of $40 for $5. What is the trader's maximum gain and maximum loss? How does your answer change if it is a call option?

Put options (14,20,22,33,38,16,34)

1.38. In March, a U.S. investor instructs a broker to sell one July put option contract on a stock. The stock price is $42, and the strike price is $40. The option price is $3. Explain what the investor has agreed to. Under what circumstances will the trade prove to be profitable? What are the risks?

Put options (14,20,22,33,38,16,34)

1.16. Suppose that you own 5,000 shares worth $25 each. How can put options be used to provide you with insurance against a decline in the value of your holding over the next 4 months?

Put options (14,20,22,33,38,16,34)

1.34. “Buying a put option on a stock when the stock is owned is a form of insurance.”

Explain this statement.

Call options (21,19)

1.21. It is May, and a trader writes a September call option with a strike price of $20. The stock price is $18, and the option price is $2. Describe the trader's cash flows if the option is held until September and the stock price is $25 at that time.

Call options (21,19)

1.19. Suppose that a March call option to buy a share for $50 costs $2.50 and is held until March. Under what circumstances will the holder of the option make a profit? Under what circumstances will the option be exercised? Draw a diagram illustrating how the profit from a long position in the option depends on the stock price at the maturity of the option.

Stock vs. call (15,35)

1.15. You would like to speculate on a rise in the price of a certain stock. The current stock price is $29, and a 3-month call with a strike price of $30 costs $2.90. You have $5,800 to invest. Identify two alternative investment strategies, one in the stock and the other in an option on the stock. What are the potential gains and losses from each?

Stock vs. call (15,35)

1.35. On May 21, 2020, the spot ask price of Apple stock is $316.50, and the ask price of a call option with a strike price of $320 and a maturity date of September is $21.70. A trader is considering two alternatives: buy 100 shares of the stock and buy 100 September call options. For each alternative, what is (a) the upfront cost, (b) the total gain if the stock price in September is $400, and (c) the total loss if the stock price in September is $300. Assume that the option is not exercised before September and positions are unwound at option maturity.

Forward vs. call (37)

1.37. Trader A enters into a forward contract to buy an asset for $1,000 in one year. Trader B buys a call option to buy the asset for $1,000 in one year. The cost of the option is $100. What is the difference between the positions of the traders? Show the profit as a function of the price of the asset in one year for the two traders.

Decide what you have to do (23,24,39)

1.23. A company knows that it is due to receive a certain amount of a foreign currency in 4 months. What type of option contract is appropriate for hedging?

Decide what you have to do (23,24,39)

1.24. A U.S. company expects to have to pay 1 million Canadian dollars in 6 months. Explain how the exchange rate risk can be hedged using (a) a forward contract and (b) an option.

Decide what you have to do (23,24,39)

1.39. A U.S. company knows it will have to pay 3 million euros in three months. The current exchange rate is 1.1500 dollars per euro. Discuss how forward and options contracts can be used by the company to hedge its exposure.

Discussions (17,18,26,27,32)

1.17. When first issued, a stock provides funds for a company. Is the same true of a stock option? Discuss.

Discussions (17,18,26,27,32)

1.18. Explain why a futures contract can be used for either speculation or hedging.

Discussions (17,18,26,27,32)

1.26. The CME Group offers a futures contract on long-term Treasury bonds. Characterize the traders likely to use this contract.

Discussions (17,18,26,27,32)

1.27. “Options and futures are zero-sum games.” What do you think is meant by this?

Discussions (17,18,26,27,32)

1.32. A trader buys a call option with a strike price of $30 for $3. Does the trader ever exercise the option and lose money on the trade? Explain your answer.

Find the arbitrage opportunities (31,36,41)

1.31. Suppose that USD/sterling spot and forward exchange rates are as follows:

Spot	1.2580
90-day forward	1.2556
180-day forward	1.2518

What opportunities are open to an arbitrageur in the following situations?

(a)A 180-day European call option to buy £1 for $1.22 costs 2 cents.

(b)A 90-day European put option to sell £1 for $1.29 costs 2 cents.

Find the arbitrage opportunities (31,36,41)

1.36. What is arbitrage? Explain the arbitrage opportunity when the price of a dually listed mining company stock is $50 (USD) on the New York Stock Exchange and $60 (CAD) on the Toronto Stock Exchange. Assume that the exchange rate is such that 1 U.S. dollar equals 1.21 Canadian dollars. Explain what is likely to happen to prices as traders take advantage of this opportunity.

Find the arbitrage opportunities (31,36,41)

1.41. The price of gold is currently $1,200 per ounce. The forward price for delivery in 1 year is $1,300 per ounce. An arbitrageur can borrow money at 3% per annum. What should the arbitrageur do? Assume that the cost of storing gold is zero and that gold provides no income.

Advanced topics (28,29,40,42,43,44)

1.28. Describe the profit from the following portfolio: a long forward contract on an asset and a long European put option on the asset with the same maturity as the forward contract and a strike price that is equal to the forward price of the asset at the time the portfolio is set up.

Advanced topics (28,29,40,42,43,44)

(1.29) ICONS

1. In the 1980s, Bankers Trust developed *index currency option notes* (ICONs).
2. These were bonds in which the amount received by the holder at maturity varied with a foreign exchange rate.
3. One example was its trade with the Long Term Credit Bank of Japan.
4. The ICON specified that if the yen/USD exchange rate, S_T, is greater than 169 yen per dollar at maturity (in 1995), the holder of the bond receives $1,000.
5. If it is less than 169 yen per dollar, the amount received by the holder of the bond is $1000 - \max\left[\, 0, 1000\left(\frac{169}{S_T} - 1\right)\,\right]$.
6. When the exchange rate is below 84.5, nothing is received by the holder at maturity.

Show that this ICON is a combination of a regular bond and two options.

Advanced topics (28,29,40,42,43,44)

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Advanced topics (28,29,40,42,43,44)

(1.29) ICONS

5. If it is less than 169 yen per dollar, the amount received by the holder of the bond is

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Advanced topics (28,29,40,42,43,44)

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6. When the exchange rate is below 84.5, nothing is received by the holder at maturity.

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Advanced topics (28,29,40,42,43,44)

if S_T > 169, 1000

if 84.5 < S_T < 169, 1000-1000(169/S_T -1) = 2000 - 169000/S_T

if S_T < 84.5, 0

	Bond	169000 short call Max (1/S_T - 1/169,0)	169000 long call Max (1/S_T - 1/84.5, 0)	whole
S_T > 169	1000			1000
84.5 < S_T < 169	1000	-169000 (1/S_T - 1/169)	0	2000 – 169000/S_T
S_T < 84.5	1000	-169000 (1/S_T - 1/169)	169000(1/S_T - 1/84.5)	0

short call at 1/169 = 0.0059

long call at 1/84.5 = 0.01183

Advanced topics (28,29,40,42,43,44)

1.40. A stock price is $29. A trader buys one call option contract on the stock with a strike price of $30 and sells a call option contract on the stock with a strike price of $32.50. The market prices of the options are $2.75 and $1.50, respectively. The options have the same maturity date. Describe the trader's position.

Advanced topics (28,29,40,42,43,44)

1.42. On May 21, 2020, an investor owns 100 Apple shares. The share price is about $316, and a December put option with a strike price of $290 costs $21.30. The investor is comparing two alternatives to limit downside risk. The first involves buying one December put option contract with a strike price of $290. The second involves instructing a broker to sell the 100 shares as soon as Apple's price reaches $290. Discuss the advantages and disadvantages of the two strategies.

Advanced topics (28,29,40,42,43,44)

(1.43) A bond issued by Standard Oil

1. A bond issued by Standard Oil some time ago worked as follows.
2. The holder received no interest.
3. At the bond's maturity, the company promised to pay $1,000 plus an additional amount based on the price of the oil at that time.
4. The additional amount was equal to $170 \times$ the excess (if any) of the price of a barrel of oil at maturity over $25.
5. The maximum additional amount paid was $2,550 (which corresponds to a price of $40 per barrel).

Show that the bond is a combination of a regular bond, a long position in call options on oil with a strike price of $25, and a short position in call options on oil with a strike price of $40.

Advanced topics (28,29,40,42,43,44)

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Advanced topics (28,29,40,42,43,44)

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Advanced topics (28,29,40,42,43,44)

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Advanced topics (28,29,40,42,43,44)

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기초자산: 석유의 가격

If S_T < 25, 0

If 25 < S_T < 40, 170 x (S_T - 25)

If S_T > 40, 2550

long call at 25

short call at 40

Advanced topics (28,29,40,42,43,44)

1.44. Suppose that in the situation of the following table, a corporate treasurer said: “I will have £1 million to sell in 6 months. If the exchange rate is less than 1.19, I want you to give me 1.19. If it is greater than 1.25, I will accept 1.25. If the exchange rate is between 1.19 and 1.25, I will sell the sterling for the exchange rate.” How could you use options to satisfy the treasurer?

	Bid	Ask
Spot	1.2217	1.2220
1-month forward	1.2218	1.2222
3-month forward	1.2220	1.2225
6-month forward	1.2224	1.2230