

LO.a: Describe how interest rate, currency, and equity swaps, futures, and forwards can be used to modify risk and return.

1. A bond portfolio manager wants to reduce the average duration of his portfolio consisting of fixed-rate government securities without selling any security. He will *most likely*:
 - A. buy fixed-rate government bond futures.
 - B. sell corporate bonds.
 - C. execute a pay-fixed interest rate swap.
2. Which of the following derivatives *least likely* bears counterparty credit risk?
 - A. An interest rate swap.
 - B. Interest rate futures.
 - C. Interest rate forwards.
3. Suppose a chemical manufacturer, Beschem Corporation, wants to expand and fund its operations in Turkey. It needs Turkish lira (TRY), but can borrow cheaply in euros an amount equivalent to €75 million. The company decides to fund in euros and swap into Turkish lira, therefore contacts a dealer and requests a quote on a pay-fixed €75 million two-year swap with semi-annual interest payments. The swap agreement requires that both parties pay a fixed-rate. Regarding the, currency swap which of the following is *correct*?
 - A. At the currency swap origination, Beschem receives euros from the swap dealer and passes it to the Eurozone borrower.
 - B. At each payment date, Beschem receives fixed-rate euro payment from the swap dealer and passes it on to the Eurozone lender.
 - C. At maturity, Beschem returns the notional amount in euros to the swap dealer and pays the Eurozone lender.
4. AAI is a South African company that imports certain goods from Europe and feels that the ZAR (South African Rand) will depreciate against the euro in the coming months. This will impact its €20 million payment in 9 months to the Eurozone manufacturer. The current exchange rate is: 15 ZAR/EUR. AAI decides to hedge its foreign exchange risk via a futures contract. The number of contracts needed to fund the payment if contract size is €125,000/contract is *closest* to:
 - A. 160.
 - B. 200.
 - C. 2,400.
5. A pension fund manager wants to temporarily reduce his equity exposure by \$50,000,000. The manager enters into a six-month Libor-based equity swap with one payment at termination, The six-month Libor at the start of the contract is 1.25%. At the end of six months the portfolio is down by 0.5%. At expiration, the portfolio manager will:
 - A. pay \$62,500.
 - B. pay \$250,000.
 - C. receive \$562,500.

LO.b: Describe how to replicate an asset by using options and by using cash plus forwards or futures.

6. Which option portfolio with the same strike price and expiration for both options is *most* similar to a short stock position?
 - A. Long call, short put.
 - B. Short call, long put.
 - C. Short call, short put.
7. A long position in a stock can *most likely* be created by combining:
 - A. a risk-free asset and a long futures position.
 - B. a risk-free asset and a short futures position.
 - C. a long put and a short call both with same strike price.

LO.c: Describe the investment objectives, structure, payoff, and risk(s) of a covered call position.

8. A covered call is an option strategy in which an investor:
 - A. with a long stock position buys a put and writes a call.
 - B. owns shares and buys a put.
 - C. owns shares and writes a call.
9. Which of the following statements is *least likely* correct? A covered call strategy is appropriate for an investor who:
 - A. wants to generate income.
 - B. wants to sell a stock and expects the price to remain stable in the short term.
 - C. who believes that the stock is undervalued and wants to benefit if price increases.

LO.d: Describe the investment objectives, structure, payoff, and risks(s) of a protective put position.

10. Which of the following statements is *least likely* correct regarding option premium?
 - A. If an option is in-the-money, the option premium will generally have an intrinsic value and time value.
 - B. With stock at \$16.20, a one-month 16-strike put for \$0.50 has a premium that is entirely time value.
 - C. A call option with 15 days to maturity, strike price of \$25 has an option premium largely consisting of time value at the current stock price of \$26.
11. A protective put can be compared to buying insurance because:
 - A. it offers full protection against a loss when stock price declines.
 - B. the exercise price minus the put premium is similar to the insurance deductible.
 - C. it entails a deductible, which is equivalent to loss the investor is ready to bear.

LO.e: Calculate and interpret the value at expiration, profit, maximum profit, maximum loss, and breakeven underlying price at expiration for covered calls and protective puts.

12. You have the following information related to a covered call position: stock price when option position opened = 20.00; option exercise price = 25.00; call premium received = 1.33. What is the maximum profit and breakeven stock price from writing a covered call?
- A. Max Gain = 5.00; Breakeven = 23.67.
 - B. Max Gain = 6.33; Breakeven = 18.67
 - C. Max Gain = 6.40; Breakeven = 21.33
13. You have the following information related to a protective put: stock price when option position opened = 20.00; option exercise price = 15.00; stock price at option expiration = 25.00; put premium paid = 1.05. The profit with the protective put is *closest* to:
- A. 21.00.
 - B. 6.00.
 - C. 4.00.
14. The maximum loss in a protective put is given by which of the following equations:
- A. $S_T - S_0 - p_0$.
 - B. $S_0 - X + p_0$.
 - C. $S_0 + p_0$.

LO.f: Contrast protective put and covered call positions to being long an asset and short a forward on the asset.

15. The position delta of an at-the-money covered call contract on 100 shares is equal to the delta of :
- A. a long position of 100 shares and short forward position of 50 shares.
 - B. a long position of 50 shares and short forward position of 100 shares.
 - C. a long position of 100 shares and short forward position of 100 shares.
16. The position delta of an at-the-money protective put contract on 100 shares is equal to the delta of :
- A. a long position in 100 shares and short forward position on 50 shares.
 - B. a long position in 50 shares and short forward position on 100 shares.
 - C. a long position in 100 shares and short forward position on 100 shares.

LO.g: Describe the investment objective(s), structure, payoffs, and risks of the following option strategies: bull spread, bear spread, collar, and straddle.

17. An investor with a long stock position may establish a *collar* by:
- A. buying a put at a *lower* exercise price than the current stock price and writing a call at a *higher* exercise price than the current stock price.
 - B. buying a put at a *higher* exercise price than the current stock price and writing a put at a *lower* exercise price than the current stock price.
 - C. buying a call at a *lower* exercise price and selling a call at a *higher* exercise price than the current stock price.

18. The spread that becomes more valuable as the asset price increases is the:
- A. bear spread.
 - B. bull spread.
 - C. collar.
19. If X_H = higher exercise price, X_L = lower exercise price, p_H = higher-strike put, p_L = lower-strike put, then the breakeven point of a *bear spread* is given by the following equation:
- A. $X_L - (p_L - p_H)$.
 - B. $X_H - (p_H - p_L)$.
 - C. $X_L + (p_H - p_L)$.
20. A long straddle position is profitable if the underlying asset price is either above or below the option strike price by an amount:
- A. equal to call option premium less the put option premium.
 - B. equal to put option premium less the call option premium.
 - C. exceeding call option premium plus the put option premium.

LO.h: Calculate and interpret the value at expiration, profit, maximum profit, maximum loss, and breakeven underlying price at expiration of the following option strategies: bull spread, bear spread, collar, and straddle.

21. Assume that: $S_0 = 34.50$; NOV 35 call = 2.75; NOV 35 put = 3.12; NOV 40 call = 1.55 NOV 40 put = 7.02. The maximum gain with a NOV 35/40 bull call spread is closest to:
- A. 6.20.
 - B. 3.80.
 - C. 1.20.
22. Assume that: $S_0 = 34.50$; NOV 35 call = 2.75; NOV 35 put = 3.12; NOV 40 call = 1.55; NOV 40 put = 7.02. The maximum gain with a NOV 35/40 bear put spread is *closest* to:
- A. 3.90.
 - B. 1.10.
 - C. 5.00.
23. An investor owns a stock currently trading at 30. He decides to create a straddle by buying a 30-strike call at 2.45 and a 30-strike put at 2.43. The two breakeven points are:
- A. 4.88; - 4.88.
 - B. 32.45; 32.43.
 - C. 34.88; 25.12.

LO.i: Describe uses of calendar spreads.

24. Which of the following statements is *least likely* true regarding a calendar spread strategy?
- A. A short calendar spread is when an investor buys a near-term option and sells a longer-dated one on the same underlying asset at the same strike price.
 - B. The primary objective behind a calendar spread strategy is to take advantage of time decay.

- C. A calendar spread trader seeks to exploit time value by buying a shorter-term option and writing a longer-term option.

LO.j: Identify and evaluate appropriate derivatives strategies consistent with given investment objectives.

25. Which of the following option strategies is *most accurate* considering the direction and volatility of the underlying market?
- A. If the expected volatility of the underlying is high and outlook bullish, buy puts.
 - B. If the expected volatility of the underlying is high and outlook neutral, buy a straddle.
 - C. If the expected volatility of the underlying is low and outlook bearish, write puts.
26. Rory Mitchell's client has 100,000 share holdings in CVJ, currently trading for \$12. The client is in a very high tax bracket. Mitchell wants to protect the value of the position without a sale, since that will involve a substantial tax burden. There are no exchange-traded options on the stock. Which of the following derivatives' strategies would *most likely* protect his client's portfolio from a decline in stock price?
- A. Establish a collar by buying a put and writing a call to reduce the put premium.
 - B. Enter into an equity swap trading the total return of CVJ for Libor.
 - C. Either of the above mentioned strategies can be used.
27. Bernadette Crawley owns 100,000 shares of Lennox Limited, currently trading at \$52.00. Lennox has an earnings announcement expected in one week. Although the market anticipates an earnings increase, Crawley believes that the company may narrowly miss the consensus earnings estimate. Which of the following strategies would *most likely* protect Crawley from a decline in the stock price?
- A. Buying a protective put.
 - B. Writing call options.
 - C. Buying a straddle.

Solutions

1. C is correct. Because the manager wants to reduce the average duration of his portfolio without selling securities, one way to achieve this is with a pay-fixed interest rate swap. The portfolio is presently earning a fixed-rate income stream; therefore, he will exchange a part of this fixed-rate income with a floating-rate to lower the average duration. Buying fixed-rate bonds will increase the average duration and corporate bonds are not part of the portfolio, hence A & B are incorrect. Section 2.1.1.
2. B is correct. Interest rate futures contracts are exchange-traded and guaranteed by a clearinghouse, hence are free of credit risk. A & C are incorrect because these are over-the-counter derivatives. Section 2.1.2.
3. B is correct. Beschem requires TRY for funding its operations in Turkey, borrows in euros and passes the notional amount in euros to the swap dealer. The dealer repays in TRY which is the amount needed by Beschem at the start of the swap. At each payment date, Beschem receives the fixed-rate euro payment from the dealer and passes it to the Eurozone lender, and pays a fixed-rate TRY payment to the dealer. At maturity, Beschem returns the notional amount in TRY to the swap dealer and receives the notional amount in euros from the dealer which is passed to the Eurozone lender. Section 2.2.1.
4. A is correct. $\text{€}20,000,000 / \text{€}125,000 / \text{contract} = 160$ contracts. Section 2.2.2.
5. C is correct. The pension fund manager pays nothing because the equity portfolio declined by 0.5% in the first six months, but instead receives \$562,500 ($\text{\$}250,000 + \text{\$}312,500$), based on the portfolio return and six-month Libor of 1.25%. Note that 1.25% is an annualized number and needs to be de-annualized for the six-month period. Section 2.3.1.
6. B is correct. When both options have the same strike price and expiration, a short call and a long put produce the same payoff as the short position in a stock with the same price as the strike price of the options. A & C are incorrect. A long call and a short put have the same payoff as a long position in a stock. A short call and short put do not synthetically replicate a long or short position in a stock. Section 3.2.
7. A is correct. A synthetic long position can be created by investing in a risk-free asset and taking a long futures position. $\text{Stock} = \text{Risk-free asset} + \text{Futures}$, hence B is incorrect. A long put with the same strike price as a short call replicate a synthetically short position in a stock hence C is incorrect. Section 3.3.
8. C is correct. A covered call option strategy is when someone owns shares and writes a call on them. B is a protective put strategy and C is collar position, where the put is at an exercise price below the stock price and the call exercise price is above the stock price. Section 4.
9. C is correct. With a covered call the upside potential is capped. The holder of the call option will buy the stock at a lower-than-market price if the stock rises above the exercise price resulting in an opportunity loss for an investor. A and B are true statements. Section 4.1.

10. C is correct. In C, the option premium largely captures intrinsic value, not time value. A and B are true statements. Section 4.1.2.
11. C is correct. Buying a put is similar to buying insurance policies with the deductible equivalent to stock price minus the exercise price, the loss the investor (insured) is willing to bear. Section 4.2.1.
12. B is correct. Maximum gain for writing covered calls = Maximum gain = $(X - S_0) + c_0 = 25.00 - 20.00 + 1.33 = 6.33$. Breakeven point = $S_0 - c_0 = 20.00 - 1.33 = 18.67$. Section 4.1.4.
13. C is correct. Profit at expiration = $\text{Max}(S_T, X) - S_0 - p_0 = S_T - S_0 - p_0 = 25.00 - 20.00 - 1.05 = 3.95$. Section 4.2.2.
14. B is correct. Max loss in protective put is: $S_0 - X + p_0$. Section 4.2.2.
15. A is correct. At-the-money call option has a delta of 0.5. A covered call contract on 100 shares is an at-the-money short call option on 100 shares with a delta of -50. The overall position delta = $100 - 50 = 50$. Similarly, a portfolio with 100 shares and a short position in a forward contract for 50 shares will have a delta of $100 - 50 = 50$. Section 4.3.
16. A is correct. At-the-money put options have a delta of -0.5. A protective put contract covers 100 shares so the position delta will be $100 - 50 = 50$. Similarly, a portfolio with 100 shares and a short position in a forward contract for 50 shares will have a delta of $100 - 50 = 50$. Section 4.3.
17. A is correct. Collar on existing stock holdings may be established by buying a put with an exercise price lower than the current stock price and selling a call at an exercise price higher than the current stock price. B is incorrect because it's a bear spread option strategy. C is incorrect because it's a bull spread option strategy. Section 4.6.
18. B is correct. Bull spread is more valuable when the underlying asset price rises. A is incorrect because bear spread strategy is undertaken when underlying asset price decline is anticipated. Collar provides downside protection while reducing cash outlay hence is valuable as asset price declines. Section 5.1.
19. B is correct. With a bear spread, the investor buys the option at a higher exercise price and writes at the lower exercise price. The breakeven point is $X_H - (p_H - p_L)$. Section 5.1.2.
20. C is correct. A long straddle position is profitable when the underlying asset price changes significantly because it involves buying a call and buying a put hence paying for two option premiums. The underlying asset price has to move either above or below the option strike price by an amount more than the cost i.e. sum of the two option premiums. Section 5.3.
21. B is correct. The maximum gain in a bull spread occurs at the high exercise price. The spread = difference in strike price = $40 - 35 = 5$. The cost of the spread = lower-strike option

- premium - higher-strike option premium = $2.75 - 1.55 = 1.20$. The maximum gain is $5.00 - 1.20 = 3.80$. Section 5.1.1.
22. B is correct. In case of a bear spread the maximum gain is at a stock price of 35 or lower. Max gain = difference in strike price – cost of the spread = $5.00 - 7.02 + 3.12 = 1.10$. Section 5.1.2.
23. C is correct. The cost of the two options is $2.45 + 2.43 = 4.88$. The break-even points are: $30.00 + 4.88 = 34.88$ and $30.00 - 4.88 = 25.12$. Section 5.3.
24. C is correct. A calendar spread trader seeks opportunity to exploit time value by purchasing a longer-date option and writing a shorter-dated one that is expected to expire without value. A & B are true statements. Section 5.2.
25. B is correct. A straddle buyer is neither bullish nor bearish but expects a sharp increase in volatility. Section 6.1.
26. C is correct. Rory can use either of the strategies that is, a collar or an equity swap to protect his client's position without creating a tax burden through an outright sale. Section 6.4.3.
27. A is correct. Put options will protect Crawley against a fall in stock price. B is incorrect because by writing calls protection is limited and will result in an opportunity cost if the stock price rises above the call exercise price. C is incorrect because a volatility increase in the underlying is not expected hence a long straddle is not appropriate. Section 6.4.2.1.