

*Derivatives Markets, 3e (McDonald)*

**Chapter 2 An Introduction to Forwards and Options**

2.1 Multiple Choice

1) The spot price of the market index is \$900. A 3-month forward contract on this index is priced at \$930. What is the profit or loss to a short position if the spot price of the market index rises to \$920 by the expiration date?

- A) \$20 gain
- B) \$20 loss
- C) \$10 gain
- D) \$10 loss

Answer: C

2) The spot price of the market index is \$900. A 3-month forward contract on this index is priced at \$930. The market index rises to \$920 by the expiration date. The annual rate of interest on treasuries is 2.4% (0.2% per month). What is the difference in the payoffs between a long index investment and a long forward contract investment? (Assume monthly compounding.)

- A) \$10.84
- B) \$24.59
- C) \$26.40
- D) \$43.20

Answer: B

3) The spot price of the market index is \$900. A 3-month forward contract on this index is priced at \$930. The annual rate of interest on treasuries is 2.4% (0.2% per month). What annualized rate of interest makes the net payoff zero? (Assume monthly compounding.)

- A) 4.8%
- B) 8.5%
- C) 11.2%
- D) 13.2%

Answer: D

4) The spot price of the market index is \$900. After 3 months, the market index is priced at \$920. An investor has a long call option on the index at a strike price of \$930. After 3 months, what is the investor's profit or loss?

- A) \$10 loss
- B) \$0
- C) \$10 gain
- D) \$20 gain

Answer: B

5) The spot price of the market index is \$900. After 3 months the market index is priced at \$920. The annual rate of interest on treasuries is 2.4% (0.2% per month). The premium on the long put, with an exercise price of \$930, is \$8.00. What is the profit or loss at expiration for the long put?

- A) \$2.00 gain
- B) \$2.00 loss
- C) \$1.95 gain
- D) \$1.95 loss

Answer: C

6) The spot price of the market index is \$900. After 3 months the market index is priced at \$920. The annual rate of interest on treasuries is 2.4% (0.2% per month). The premium on the long put, with an exercise price of \$930, is \$8.00. At what index price does a long put investor have the same payoff as a short index investor? Assume the short position has a breakeven price of \$930.

- A) \$921.90
- B) \$930.00
- C) \$938.05
- D) \$940.00

Answer: C

7) All of the positions listed will benefit from a price decline, except:

- A) Short put
- B) Long put
- C) Short call
- D) Short stock

Answer: A

8) The spot price of the market index is \$900. The annual rate of interest on treasuries is 2.4% (0.2% per month). After 3 months the market index is priced at \$920. An investor has a long call option on the index at a strike price of \$930. What profit or loss will the writer of the call option earn if the option premium is \$2.00?

- A) \$2.00 gain
- B) \$2.00 loss
- C) \$2.01 gain
- D) \$2.01 loss

Answer: C

9) The spot price of the market index is \$900. After 3 months the market index is priced at \$915. The annual rate of interest on treasuries is 2.4% (0.2% per month). The premium on the long put, with an exercise price of \$930, is \$8.00. Calculate the profit or loss to the short put position if the final index price is \$915.

- A) \$15.00 gain
- B) \$15.00 loss
- C) \$6.95 gain
- D) \$6.95 loss

Answer: D

10) If your homeowner's insurance premium is \$1,000 and your deductible is \$2000, what could be considered the strike price of the policy if the home has a value of \$120,000?

- A) \$118,000
- B) \$120,000
- C) \$117,000
- D) \$122,000

Answer: A

11) A put option is purchased and held for 1 year. The Exercise price on the underlying asset is \$40. If the current price of the asset is \$36.45 and the future value of the original option premium is (-\$1.62), what is the put profit, if any, at the end of the year?

- A) \$1.62
- B) \$1.93
- C) \$3.55
- D) \$5.17

Answer: B

12) The premium on a long term call option on the market index with an exercise price of 950 is \$12.00 when originally purchased. After 6 months the position is closed, and the index spot price is 965. If interest rates are 0.5% per month, what is the Call Payoff?

- A) \$2.64
- B) \$12.00
- C) \$12.36
- D) \$15.00

Answer: D

13) The premium on a call option on the market index with an exercise price of 1050 is \$9.30 when originally purchased. After 2 months the position is closed, and the index spot price is 1072. If interest rates are 0.5% per month, what is the Call Profit?

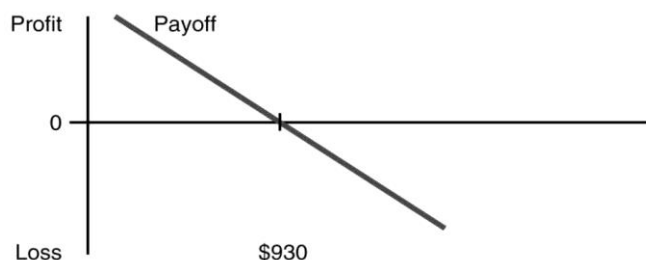
- A) \$9.30
- B) \$9.39
- C) \$12.61
- D) \$22.00

Answer: C

## 2.2 Short Answer Essay Questions

1) The spot price of the market index is \$900. A 3-month forward contract on this index is priced at \$930. Draw the payoff graph for the short position in the forward contract.

Answer:

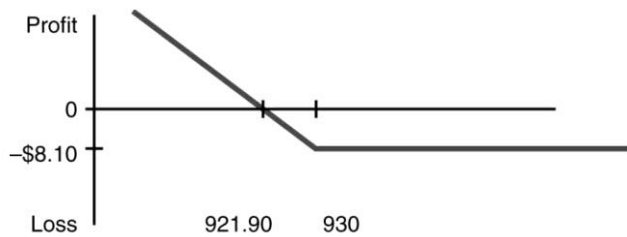


2) An investor has a long call option on the market index at a strike price of \$930. At expiration the index price is \$920. Explain the profit and loss.

Answer: The long call investor has the right, not the obligation, to exercise. Thus, she will elect to let the option expire unexercised and realize no profit or loss.

3) The spot price of the market index is \$900. After 3 months the market index is priced at \$920. The annual rate of interest on treasuries is 4.8% (0.4% per month). The premium on the long put, with an exercise price of \$930, is \$8.00. Draw the payoff graph for the long put position at expiration. Include strike price, breakeven price, and max loss.

Answer:



4) Develop the payoff table for the previous question, using at least five different possible index prices, in addition to the strike price and breakeven price.

Answer:

Index Price	Put Payoff	FV of Premium	Profit/Loss
890	40.00	-8.10	31.90
900	30.00	-8.10	21.90
910	20.00	-8.10	11.90
921.90	8.10	-8.10	0
930	0	-8.10	-8.10
940	0	-8.10	-8.10
950	0	-8.10	-8.10

5) As with Chrysler Corp. many years ago, the government occasionally guarantees loans. What option is the government granting and to whom in a loan guarantee?

Answer: The government is giving the banks (or lenders) a put option. If the borrower defaults (thus the price of the loan drops) the banks may exercise their put options and sell the loans to the government.

### 2.3 Class Discussion Question

1) Engage the class in a conversation about auto insurance. Why do people feel their premium is wasted if they do not file a claim? Steer the class towards an understanding of put options and potential gain should a loss occur. It may also be beneficial to ask students to relate insurers' pooling of losses with the concept of risk management.