

Speculators purchase call options on currencies that they expect to strengthen against the dollar. If the foreign currency strengthens as expected, they can exercise their call options to purchase the currency at the exercise price and then sell the currency at the prevailing exchange rate.

A **currency put option** provides the right to sell a specified currency for a specified price within a specified period of time. Corporations involved in international business transactions may purchase put options to hedge future receivables. If the exchange rate at the time they receive payment in a foreign currency is less than the strike price, they can exercise their option by selling the currency at that price. But if the prevailing exchange rate is higher than the exercise price, they can sell the currency at the prevailing exchange rate and let the options expire.

Speculators purchase put options on currencies they expect to weaken against the dollar. If the foreign currency weakens as expected, the speculators can purchase the currency at the prevailing spot rate and exercise their put options to sell the currency at the exercise price.

For every buyer of a currency call or put option, there must be a seller (or writer). A writer of a call option is obligated to sell the specified currency at the specified strike price if the option is exercised. A writer of a put option is obligated to purchase the specified currency at the specified strike price if the option is exercised. Speculators are inclined to write call options on foreign currencies that they expect to weaken against the dollar or to write put options on those they expect to strengthen against the dollar. If a currency option expires without being exercised, the writer earns the up-front premium received.

SUMMARY

- Stock options are traded on exchanges, just as many stocks are. Orders submitted by a brokerage firm are transmitted to a trading floor, where floor brokers execute the trades. Many trades are executed electronically.
- The premium of a call option is influenced by the characteristics of the option and of the underlying stock that can affect the potential gains. In particular, the premium is higher when the market price of the stock is high relative to the exercise price, when the stock's volatility is greater, and when the term until expiration is longer. For put options, the higher the market price of the stock relative to the exercise price, the lower the premium. The volatility of the underlying stock and the term to expiration are related to the put option premium in the same manner as they are to the call option premium.
- Speculators purchase call options on stocks whose prices are expected to rise and purchase put options on those expected to decrease.
- Financial institutions can hedge against adverse movements in a stock by selling call options on that stock. Alternatively, they can purchase put options on that stock.
- Financial institutions commonly hedge their stock portfolios by purchasing put options on stock indexes. They may also use stock index options as a tool for dynamic asset allocation, increasing their exposure when they have optimistic views about the stock market and reducing their exposure (buying put options on stock indexes) when they have pessimistic views.
- Speculators purchase call options on interest rate futures contracts when they expect interest rates to decrease. Financial institutions with large holdings of long-term debt securities hedge against interest rate risk by purchasing put options on interest rate futures. Index options can be used to speculate on movements in stock indexes and require only a small investment. Put options on stock indexes can be purchased to hedge a stock portfolio whose movements are similar to that of the stock index. Options on stock index futures can be used to speculate on movements in the value of the stock index futures contract. Put options on stock index futures can be purchased to hedge portfolios of stocks that move in tandem with the stock index.

POINT COUNTER-POINT

If You Were a Major Shareholder of a Publicly Traded Firm, Would You Prefer That Stock Options Be Traded on That Stock?

Point No. Options can be used by investors to speculate, and excessive trading of the options may push the stock price away from its fundamental price.

Counter-Point Yes. Options can be used by investors to temporarily hedge against adverse move-

ments in the stock, so they may reduce the selling pressure on the stock in some periods.

Who Is Correct? Use the Internet to learn more about this issue and then formulate your own opinion.

QUESTIONS AND APPLICATIONS

1. Options versus Futures Describe the general differences between a call option and a futures contract.

2. Speculating with Call Options How are call options used by speculators? Describe the conditions under which their strategy would backfire. What is the maximum loss that could occur for a purchaser of a call option?

3. Speculating with Put Options How are put options used by speculators? Describe the conditions under which their strategy would backfire. What is the maximum loss that could occur for a purchaser of a put option?

4. Selling Options Under what conditions would speculators sell a call option? What is the risk to speculators who sell put options?

5. Factors Affecting Call Option Premiums Identify the factors affecting the premium paid on a call option. Describe how each factor affects the size of the premium.

6. Factors Affecting Put Option Premiums Identify the factors affecting the premium paid on a put option. Describe how each factor affects the size of the premium.

7. Leverage of Options How can financial institutions with stock portfolios use stock options when they expect stock prices to rise substantially but do not yet have sufficient funds to purchase more stock?

8. Hedging with Put Options Why would a financial institution holding the stock of Hinton Co. consider buying a put option on that stock rather than simply selling it?

9. Call Options on Futures Describe a call option on interest rate futures. How does it differ from purchasing a futures contract?

10. Put Options on Futures Describe a put option on interest rate futures. How does it differ from selling a futures contract?

Advanced Questions

11. Hedging Interest Rate Risk Assume a savings institution has a large amount of fixed-rate mortgages and obtains most of its funds from short-term deposits. How could it use options on financial futures to hedge its exposure to interest rate movements? Would futures or options on futures be more appropriate if the institution is concerned that interest rates will decline, causing a large number of mortgage prepayments?

12. Hedging Effectiveness Three savings and loan institutions (S&Ls) have identical balance sheet compositions: a high concentration of short-term deposits that are used to provide long-term, fixed-rate mortgages. The S&Ls took the following positions one year ago.

NAME OF S&L	POSITION
LaCrosse	Sold financial futures
Stevens Point	Purchased put options on interest rate futures
Whitewater	Did not take any position in futures

Assume that interest rates declined consistently over the last year. Which of the three S&Ls would have achieved the best performance based on this information? Explain.

13. Change in Stock Option Premiums Explain how and why the option premiums may change in response to a surprise announcement that the Fed will increase interest rates, even if stock prices are not affected.

14. Speculating with Stock Options The price of Garner stock is \$40. There is a call option on Garner stock that is at the money with a premium of \$2.00. There is a put option on Garner stock that is at the money with a premium of \$1.80. Why would investors consider writing this call option and this put option? Why would some investors consider buying this call option and this put option?

15. How Stock Index Option Prices May Respond to Prevailing Conditions Consider the prevailing conditions that could affect the demand for stocks, including inflation, the economy, the budget deficit, the Fed's monetary policy, political conditions, and the general mood of investors. Based on these conditions, would you consider purchasing stock index options at this time? Offer some logic to support your answer. Which factor do you think will have the biggest impact on stock index option prices?

16. Backdating Stock Options Explain what backdating stock options entails. Is backdating consistent with rewarding executives who help to maximize shareholder wealth?

17. CBOE Volatility Index How would you interpret a large increase in the CBOE volatility index (VIX)? Explain why the VIX increased substantially during the credit crisis.

Interpreting Financial News

Interpret the following comments made by Wall Street analysts and portfolio managers.

- a. "Our firm took a hit because we wrote put options on stocks just before the stock market crash."
- b. "Before hedging our stock portfolio with options on index futures, we search for the index that is most appropriate."

- c. "We prefer to use covered call writing to hedge our stock portfolios."

Managing in Financial Markets

Hedging with Stock Options As a stock portfolio manager, you have investments in many U.S. stocks and plan to hold these stocks over a long-term period. However, you are concerned that the stock market may experience a temporary decline over the next three months and that your stock portfolio will probably decline by about the same degree as the market. You are aware that options on S&P 500 index futures are available. The following options on S&P 500 index futures are available and have an expiration date about three months from now:

STRIKE PRICE	CALL PREMIUM	PUT PREMIUM
1372	40	24
1428	24	40

The options on S&P 500 index futures are priced at \$250 times the quoted premium. Currently, the S&P 500 index level is 1400. The strike price of 1372 represents a 2 percent decline from the prevailing index level, and the strike price of 1428 represents an increase of 2 percent above the prevailing index level.

- a. Assume that you want to take an options position to hedge your entire portfolio, which is currently valued at about \$700,000. How many index option contracts should you take a position in to hedge your entire portfolio?
- b. Assume that you want to create a hedge so that your portfolio will lose no more than 2 percent from its present value. How can you take a position in options on index futures to achieve this goal? What is the cost to you as a result of creating this hedge?
- c. Given your expectations of a weak stock market over the next three months, how can you generate some fees from the sale of options on S&P 500 index futures to help cover the cost of purchasing options?

PROBLEMS

1. Writing Call Options A call option on Illinois stock specifies an exercise price of \$38. Today, the stock's price is \$40. The premium on the call option is \$5. Assume the option will not be exercised until maturity, if at all. Complete the following table:

ASSUMED STOCK PRICE AT THE TIME THE CALL OPTION IS ABOUT TO EXPIRE	NET PROFIT OR LOSS PER SHARE TO BE EARNED BY THE WRITER (SELLER) OF THE CALL OPTION
\$37	
39	
41	
43	
45	
48	

2. Purchasing Call Options A call option on Michigan stock specifies an exercise price of \$55. Today, the stock's price is \$54 per share. The premium on the call option is \$3. Assume the option will not be exercised until maturity, if at all. Complete the following table for a speculator who purchases the call option:

ASSUMED STOCK PRICE AT THE TIME THE CALL OPTION IS ABOUT TO EXPIRE	NET PROFIT OR LOSS PER SHARE TO BE EARNED BY THE SPECULATOR
\$50	
52	
54	
56	
58	
60	
62	

3. Purchasing Put Options A put option on Iowa stock specifies an exercise price of \$71. Today, the stock's price is \$68. The premium on the put option is

\$8. Assume the option will not be exercised until maturity, if at all. Complete the following table for a speculator who purchases the put option (and currently does not own the stock):

ASSUMED STOCK PRICE AT THE TIME THE PUT OPTION IS ABOUT TO EXPIRE	NET PROFIT OR LOSS PER SHARE TO BE EARNED BY THE SPECULATOR
\$60	
64	
68	
70	
72	
74	
76	

4. Writing Put Options A put option on Indiana stock specifies an exercise price of \$23. Today, the stock's price is \$24. The premium on the put option is \$3. Assume the option will not be exercised until maturity, if at all. Complete the following table:

ASSUMED STOCK PRICE AT THE TIME THE PUT OPTION IS ABOUT TO EXPIRE	NET PROFIT OR LOSS PER SHARE TO BE EARNED BY THE WRITER (OR SELLER) OF THE PUT OPTION
\$20	
21	
22	
23	
24	
25	
26	

5. Covered Call Strategy

a. Evanston Insurance, Inc., has purchased shares of Stock E at \$50 per share. It will sell the stock in six months. It considers using a strategy of covered call

writing to partially hedge its position in this stock. The exercise price is \$53, the expiration date is six months, and the premium on the call option is \$2. Complete the following table:

POSSIBLE PRICE OF STOCK E IN SIX MONTHS	PROFIT OR LOSS PER SHARE IF A COVERED CALL STRATEGY IS USED	PROFIT OR LOSS PER SHARE IF A COVERED CALL STRATEGY IS NOT USED
\$47		
50		
52		
55		
57		
60		

b. Assume that each of the six stock prices in the table's first column has an equal probability of occurring. Compare the probability distribution of the profits (or losses) per share when using covered call writing versus not using it. Would you recommend covered call writing in this situation? Explain.

6. Put Options on Futures Purdue Savings and Loan Association purchased a put option on Treasury bond futures with a September delivery date and an exercise price of 91-16. The put option has a premium of 1-32. Assume that the price of the Treasury bond futures decreases to 88-16. Should Purdue exercise the option or let it expire? What is Purdue's net gain or loss after accounting for the premium paid on the option?

7. Call Options on Futures Wisconsin, Inc., purchased a call option on Treasury bond futures at a premium of 2-00. The exercise price is 92-08. If the price of the Treasury bond futures rises to 93-08, should Wisconsin exercise the call option or let it expire? What is Wisconsin's net gain or loss after accounting for the premium paid on the option?

8. Call Options on Futures DePaul Insurance Company purchased a call option on an S&P 500 futures contract. The option premium is quoted as \$6. The exercise price is 1430. Assume the index on the futures contract becomes 1440. Should DePaul exercise the call option or let it expire? What is the net gain or loss to DePaul after accounting for the premium paid for the option?

9. Covered Call Strategy Coral, Inc., has purchased shares of Stock M at \$28 per share. Coral will sell the stock in six months. It considers using a strategy of covered call writing to partially hedge its position in this stock. The exercise price is \$32, the expiration date is six months, and the premium on the call option is \$2.50. Complete the following table:

POSSIBLE PRICE OF STOCK M IN SIX MONTHS	PROFIT OR LOSS PER SHARE IF COVERED CALL STRATEGY IS USED
\$25	
28	
33	
36	

10. Hedging with Bond Futures Smart Savings Bank desired to hedge its interest rate risk. It considered two possibilities: (1) sell Treasury bond futures at a price of 94-00, or (2) purchase a put option on Treasury bond futures. At the time, the price of Treasury bond futures was 95-00. The face value of Treasury bond futures was \$100,000. The put option premium was 2-00, and the exercise price was 94-00. Just before the option expired, the Treasury bond futures price was 91-00, and Smart Savings Bank would have exercised the put option at that time, if at all. This is also the time when it would have offset its futures position, if it had sold futures. Determine the net gain to Smart Savings Bank if it had sold Treasury bond futures versus if it had purchased a put option on Treasury bond futures. Which alternative would have been more favorable, based on the situation that occurred?

FLOW OF FUNDS EXERCISE

Hedging with Options Contracts

Carson Company would like to acquire Vinnet, Inc., a publicly traded firm in the same industry. Vinnet's stock price is currently much lower than the prices of other firms in the industry because it is inefficiently managed. Carson believes that it could restructure Vinnet's operations and improve its performance. It is about to contact Vinnet to determine whether Vinnet will agree to an acquisition. Carson is somewhat concerned that investors may learn of its plans and buy Vinnet stock in anticipation that Carson will need to pay a high premium (perhaps a 30 percent premium above the prevailing stock price) in order to complete the acquisition. Carson decides to call a bank about its

risk, as the bank has a brokerage subsidiary that can help it hedge with stock options.

- a. How can Carson use stock options to reduce its exposure to this risk? Are there any limitations to this strategy, given that Carson will ultimately have to buy most or all of the Vinnet stock?
- b. Describe the maximum possible loss that may be directly incurred by Carson as a result of engaging in this strategy.
- c. Explain the results of the strategy you offered in the previous question if Vinnet plans to avoid the acquisition attempt by Carson.

INTERNET/EXCEL EXERCISES

1. Go to www.cboe.com and, under "Quotes & Data," select "Delayed Quotes Classic." Insert the ticker symbol for a stock option in which you are interested. Assess the results. Did the premium ("Net") on the call options increase or decrease today? Did the premium on the put options increase or decrease today?

2. Based on the changes in the premium, do you think the underlying stock price increased or decreased? Explain.

ONLINE ARTICLES WITH REAL-WORLD EXAMPLES

Find a recent practical article available online that describes a real-world example regarding a specific financial institution or financial market that reinforces one or more concepts covered in this chapter.

If your class has an online component, your professor may ask you to post your summary of the article there and provide a link to the article so that other students can access it. If your class is live, your professor may ask you to summarize your application of the article in class. Your professor may assign specific students to complete this assignment or may allow any students to do the assignment on a volunteer basis.

For recent online articles and real-world examples related to this chapter, consider using the following search terms (be sure to include the prevailing year as

a search term to ensure that the online articles are recent):

1. stock options AND profits
2. stock options AND losses
3. stock options AND speculators
4. stock options AND hedge
5. stock option premium AND volatility
6. stock option AND ETFs
7. stock index option
8. LEAPs AND speculate
9. selling stock options AND cover
10. stock options AND compensation