

combined in a wide variety of ways to create new instruments. These basic contract types are really just the building blocks used by financial engineers to create new and innovative products for corporate risk management.

## Chapter Review and Self-Test Problems

- 23.1 Futures Contracts** Suppose Golden Grain Farms (GGF) expects to harvest 50,000 bushels of wheat in September. GGF is concerned about the possibility of price fluctuations between now and September. The futures price for September wheat is \$2 per bushel, and the relevant contract calls for 5,000 bushels. What action should GGF take to lock in the \$2 price? Suppose the price of wheat actually turns out to be \$3. Evaluate GGF's gains and losses. Do the same for a price of \$1. Ignore marking-to-market.
- 23.2 Options Contracts** In the previous question, suppose that September futures put options with a strike price of \$2 per bushel cost \$.15 per bushel. Assuming that GGF hedges using put options, evaluate its gains and losses for wheat prices of \$1, \$2, and \$3.

## Answers to Chapter Review and Self-Test Problems

- 23.1** GGF wants to deliver wheat and receive a fixed price, so it needs to *sell* futures contracts. Each contract calls for delivery of 5,000 bushels, so GGF needs to sell 10 contracts. No money changes hands today.
- If wheat prices actually turn out to be \$3, then GGF will receive \$150,000 for its crop, but it will have a loss of \$50,000 on its futures position when it closes that position because the contracts require it to sell 50,000 bushels of wheat at \$2, when the going price is \$3. He thus nets \$100,000 overall.
- If wheat prices turn out to be \$1 per bushel, then the crop will be worth only \$50,000. However, GGF will have a profit of \$50,000 on its futures position, so GGF again nets \$100,000.
- 23.2** If GGF wants to insure against a price decline only, it can buy 10 put contracts. Each contract is for 5,000 bushels, so the cost per contract is  $5,000 \times \$0.15 = \$750$ . For 10 contracts, the cost will be \$7,500.
- If wheat prices turn out to be \$3, then GGF will not exercise the put options (why not?). Its crop is worth \$150,000, but it is out the \$7,500 cost of the options, so it nets \$142,500.
- If wheat prices fall to \$1, the crop is worth \$50,000. GGF will exercise its puts (why?) and thereby force the seller of the puts to pay \$2 per bushel. GGF receives a total of \$100,000. If we subtract the cost of the puts, we see that GGF's net is \$92,500. In fact, verify that its net at any price of \$2 or lower is \$92,500.

## Concepts Review and Critical Thinking Questions

- Hedging Strategies** If a firm is selling futures contracts on lumber as a hedging strategy, what must be true about the firm's exposure to lumber prices?
- Hedging Strategies** If a firm is buying call options on pork belly futures as a hedging strategy, what must be true about the firm's exposure to pork belly prices?

3. **Forwards and Futures** What is the difference between a forward contract and a futures contract? Why do you think that futures contracts are much more common? Are there any circumstances under which you might prefer to use forwards instead of futures? Explain.
4. **Hedging Commodities** Bubbling Crude Corporation, a large Texas oil producer, would like to hedge against adverse movements in the price of oil, since this is the firm's primary source of revenue. What should the firm do? Provide at least two reasons why it probably will not be possible to achieve a completely flat risk profile with respect to oil prices.
5. **Sources of Risk** A company produces an energy intensive product and uses natural gas as the energy source. The competition primarily uses oil. Explain why this company is exposed to fluctuations in both oil and natural gas prices.
6. **Hedging Commodities** If a textile manufacturer wanted to hedge against adverse movements in cotton prices, it could buy cotton futures contracts or buy call options on cotton futures contracts. What would be the pros and cons of the two approaches?
7. **Options** Explain why a put option on a bond is conceptually the same as a call option on interest rates.
8. **Hedging Interest Rates** A company has a large bond issue maturing in one year. When it matures, the company will float a new issue. Current interest rates are attractive, and the company is concerned that rates next year will be higher. What are some hedging strategies that the company might use in this case?
9. **Swaps** Explain why a swap is effectively a series of forward contracts. Suppose a firm enters into a swap agreement with a swap dealer. Describe the nature of the default risk faced by both parties.
10. **Swaps** Suppose a firm enters into a fixed-for-floating interest rate swap with a swap dealer. Describe the cash flows that will occur as a result of the swap.
11. **Transaction versus Economic Exposure** What is the difference between transactions and economic exposure? Which can be hedged more easily? Why?
12. **Hedging Exchange Rate Risk** Refer to Table 23.1 in the text to answer this question. If a U.S. company exports its goods to Japan, how would it use a futures contract on Japanese yen to hedge its exchange rate risk? Would it buy or sell yen futures? In answering, pay attention to how the exchange rate is quoted in the futures contract.
13. **Hedging Strategies** For the following scenarios, describe a hedging strategy using futures contracts that might be considered. If you think that a cross-hedge would be appropriate, discuss the reasons for your choice of contract.
  - a. A public utility is concerned about rising costs.
  - b. A candy manufacturer is concerned about rising costs.
  - c. A corn farmer fears that this year's harvest will be at record high levels across the country.
  - d. A manufacturer of photographic film is concerned about rising costs.
  - e. A natural gas producer believes there will be excess supply in the market this year.
  - f. A bank derives all its income from long-term, fixed-rate residential mortgages.
  - g. A stock mutual fund invests in large, blue-chip stocks and is concerned about a decline in the stock market.
  - h. A U.S. importer of Swiss army knives will pay for its order in six months in Swiss francs.

- i. A U.S. exporter of construction equipment has agreed to sell some cranes to a German construction firm. The U.S. firm will be paid in euros in three months.
14. **Swaps** Looking back at the EquiCredit example we used to open the chapter, why would you say EquiCredit used a swap agreement? In other words, why didn't EquiCredit just go ahead and issue fixed-rate bonds since the net effect of issuing variable-rate bonds and then doing a swap is to create a fixed-rate bond?

## Questions and Problems

### Basic

(Questions 1–4)

1. **Futures Quotes** Refer to Table 23.1 in the text to answer this question. Suppose you purchase a July 2002 cocoa futures contract on September 4, 2001. What will your profit or loss be if cocoa prices turn out to be \$1,000 per metric ton at expiration?
2. **Futures Quotes** Refer to Table 23.1 in the text to answer this question. Suppose you sell an October 2001 copper futures contract on September 4, 2001. What will your profit or loss be if copper prices turn out to be \$.90 per pound at expiration? What if copper prices are \$.50 per pound at expiration?
3. **Futures Options Quotes** Refer to Table 23.2 in the text to answer this question. Suppose you purchase the November 2001 call option on crude oil futures with a strike price of \$27.50. How much does your option cost per barrel of oil? What is the total cost? Suppose the price of oil futures is \$26.25 per barrel at expiration of the option contract. What is your net profit or loss from this position? What if oil futures prices are \$29 per barrel at expiration?
4. **Put and Call Payoffs** Suppose a financial manager buys call options on 50,000 barrels of oil with an exercise price of \$25 per barrel. She simultaneously sells a put option on 50,000 barrels of oil with the same exercise price of \$25 per barrel. Consider her gains and losses if oil prices are \$20, \$22, \$25, \$28, and \$30. What do you notice about the payoff profile?
5. **Hedging with Futures** Refer to Table 23.1 in the text to answer this question. Suppose today is September 4, 2001, and your firm is a piping manufacturer that needs 100,000 pounds of copper in March for the upcoming production run. You would like to lock in your costs today, because you're concerned that copper prices might go up between now and March.

### Intermediate

(Questions 5–6)

- a. How could you use copper futures contracts to hedge your risk exposure? What price would you be effectively locking in?
- b. Suppose copper prices are \$.76 per pound in March. What is the profit or loss on your futures position? Explain how your futures position has eliminated your exposure to price risk in the copper market.
6. **Interest Rate Swaps** ABC Company and XYZ Company need to raise funds to pay for capital improvements at their manufacturing plants. ABC Company is a well-established firm with an excellent credit rating in the debt market; it can borrow funds either at 11 percent fixed rate or at LIBOR + 1 percent floating rate. XYZ Company is a fledgling start-up firm without a strong credit history. It can borrow funds either at 10 percent fixed rate or at LIBOR + 3 percent floating rate.
  - a. Is there an opportunity here for ABC and XYZ to benefit by means of an interest rate swap?

- b. Suppose you've just been hired at a bank that acts as a dealer in the swaps market, and your boss has shown you the borrowing rate information for your clients ABC and XYZ. Describe how you could bring these two companies together in an interest rate swap that would make both firms better off, while netting your bank a 2.0 percent profit.
7. **Financial Engineering** Suppose there were call options and forward contracts available on coal, but no put options. Show how a financial engineer could synthesize a put option using the available contracts. What does your answer tell you about the general relationship between puts, calls, and forwards?
- 23.1 **Contract Specifications** You want to find the specifications for futures contracts. Go to the Chicago Board of Trade at [www.cbot.com](http://www.cbot.com) and, under the "Market Info" pull-down menu, follow the "Contract Specs" link. Now follow the "Agricultural Contracts" link and find the contract specifications for corn and rough rice. What are the contract sizes? Now follow the "MidAm Livestock" link and find the contract size for cattle and lean hogs.
- 23.2 **Futures Quotes** You want to find the price of a future on light sweet crude oils. Go to the New York Mercantile Exchange at [www.nymex.com](http://www.nymex.com) and follow the "Markets" link, the "Quotes" link, then the "Quotes, Charts, Settle" link for light sweet crude. Follow the "About the Contracts" link to find the contract specifications. What is the most recent settlement price for the shortest-term contract? For the longest-term contract? Based on these prices, what is the total dollar value of each contract?
- 23.3 **New York Board of Trade** Go to the New York Board of Trade web site at [www.nybot.com](http://www.nybot.com) and follow the "Market Information" link and the "Contract Specs" link. What contracts are traded on the New York Board of Trade? What does FCOJ stand for? What are the trading months for FCOJ futures contracts? What are the position limits for FCOJ futures contracts? What is the last trading day of the expiration month for FCOJ futures? What are the trading months and last trading day for FCOJ options contracts? What is the FCOJ differential contract?
- 23.4 **Hedging with Futures** You are working for a company that processes beef and will take delivery of 200,000 pounds of cattle in August. You would like to lock in your costs today because you are concerned about an increase in cattle prices. Go to the Chicago Mercantile Exchange (CME) at [www.cme.com](http://www.cme.com), follow the "Products" link, the "Agricultural Commodities" link, and the "Contract Specs" link. How many futures contracts will you need to hedge your exposure? How will you use these contracts? Go back to the CME home page, follow the "Prices" link, the "10-Minute Futures Updates" link, the "Agricultural Commodity Futures" and the "Live Cattle Futures" link. What price are you effectively locking in if you trade at the last price? Suppose cattle prices increase 5 percent before the expiration. What is your profit or loss on the futures position? What if prices decrease by 5 percent? Explain how your futures position has eliminated your exposure to price risk in the live cattle market.

**Intermediate**  
(continued)

**Challenge**  
(Question 7)

**What's On  
the Web?**

