

Chapter 13

Financial Futures Markets

Outline

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Globalization of Futures Markets

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Key Concepts

1. Explain why speculators take positions in financial futures, and how the outcome is determined.
2. Explain how institutional investors hedge with interest rate futures, and the tradeoff involved.
3. Explain how stock index futures can be used by institutional investors.

POINT/COUNTER-POINT: Has the Futures Market Created More Uncertainty for Stocks?

POINT: Yes. Futures contracts encourage speculation on indexes. Thus, an entire market can be influenced by the trading of speculators.

COUNTER-POINT: No. Futures contracts are commonly used to hedge portfolios, and therefore can reduce the effects of weak market conditions. Moreover, investing in stocks is just as speculative as taking a position in futures markets.

WHO IS CORRECT? Use the Internet to learn more about this issue. Offer your own opinion on this issue.

ANSWER: While excessive speculation could affect the underlying stock price or stock index, more informed investors should be able to correct for any mispricing, and therefore push the price toward its fundamental value. In addition, speculators could trade the underlying stocks as well and could have a direct effect on the stock price.

Questions

1. **Futures Contracts.** Describe the general characteristics of a futures contract. How does a clearinghouse facilitate the trading of financial futures contracts?

ANSWER: A futures contract is a standardized agreement to deliver or receive a specified amount of a specified financial instrument at a specified price and date.

The clearinghouse records all transactions and guarantees timely payments on futures contracts. This precludes the need for a purchaser of a futures contract to check the creditworthiness of the contract seller.

2. **Futures Pricing.** How does the price of a financial futures contract change as the market price of the security it represents changes? Why?

ANSWER: As the market price of the security changes, so does the futures price, in a similar manner. The futures price should reflect the expectation as of settlement date, and expectations will change in accordance with changes in the prevailing market price.

3. **Hedging with Futures.** Explain why some futures contracts may be more suitable than others for hedging exposure to interest rate risk.

ANSWER: Ideally, the underlying instrument represented by the futures contract would be similarly sensitive to interest rate movements as the assets that are being hedged.

4. **Treasury Bond Futures.** Will speculators buy or sell Treasury bond futures contracts if they expect interest rates to increase? Explain.

ANSWER: Speculators should sell Treasury bond futures contracts. If they expected interest rates to increase, this implies expectations of lower bond prices. Thus, if security prices decline so will futures prices. Speculators could then close out their position by purchasing an identical futures contract.

5. **Gains from Purchasing Futures.** Explain how purchasers of financial futures contracts can offset their position. How is their gain or loss determined? What is the maximum loss to a purchaser of a futures contract?

ANSWER: Purchasers of financial futures contracts can offset their positions by selling the identical contracts.

Their gain is the difference between what they sold the contracts for and their purchase price.

The maximum loss is the amount to be paid at settlement date as specified by the contract.

6. **Gains from Selling Futures.** Explain how sellers of financial futures contracts can offset their position. How is their gain or loss determined?

ANSWER: Sellers of financial futures contracts can offset their positions by purchasing identical contracts. Their gain is the difference between the selling price specified when they sold futures contracts versus the purchase price specified when they purchased futures contracts.

7. **Hedging with Futures.** Assume a financial institution has more rate-sensitive assets than rate-sensitive liabilities. Would it be more likely to be adversely affected by an increase or decrease in interest rates? Should it purchase or sell interest rate futures contracts in order to hedge its exposure?

ANSWER: It would be more adversely affected by a decrease in interest rates. Thus, it should purchase interest rate futures contracts to hedge its exposure.

8. **Hedging with Futures.** Assume a financial institution has more rate-sensitive liabilities than rate-sensitive assets. Would it be more likely to be adversely affected by an increase or a decrease in interest rates? Should it purchase or sell interest rate futures contracts in order to hedge its exposure?

ANSWER: It would be more adversely affected by an increase in interest rates. Thus, it should sell interest rate futures contracts to hedge its exposure.

9. **Hedging Decision.** Why do some financial institutions remain exposed to interest rate risk, even when they believe that the use of interest rate futures could reduce their exposure?

ANSWER: Some financial institutions prefer not to hedge because they wish to capitalize on their exposure. For example, a financial institution with rate-sensitive liabilities and rate-insensitive assets will benefit from its exposure to interest rate risk if interest rates decline.

10. **Long versus Short Hedge.** Explain the difference between a long hedge and a short hedge used by

financial institutions. When is a long hedge more appropriate than a short hedge?

ANSWER: A long hedge represents a purchase of financial futures and is appropriate when assets are more rate-sensitive than liabilities. A short hedge represents a sale of financial futures and is appropriate when liabilities are more rate-sensitive than assets.

- 11. Impact of Futures Hedge.** Explain how the probability distribution of a financial institution's returns is affected when it uses interest rate futures to hedge. What does this imply about its risk?

ANSWER: The probability distribution of returns narrows as a result of using interest rate futures to hedge. This implies less exposure to interest rate movements.

- 12. Cross-Hedging.** Describe the act of cross-hedging. What determines the effectiveness of a cross-hedge?

ANSWER: Cross-hedging represents the use of financial futures on one instrument to hedge a different instrument. The hedge will be more effective if the instruments are highly correlated.

- 13. Hedging with Bond Futures.** How might a savings and loan association use Treasury bond futures to hedge its fixed-rate mortgage portfolio (assuming that its main source of funds is short-term deposits)? Explain how prepayments on mortgages can limit the effectiveness of the hedge.

ANSWER: It may enact a short hedge in which it sells interest rate futures. If interest rates rise, its spread is reduced, but that can be offset by the gain on its futures position.

If interest rates decline, it will incur a loss on its futures position, which can be offset by an increase in the spread. However, if mortgages are prepaid (as homeowners refinance mortgages at the lower interest rates), the spread will not necessarily increase to offset the loss on the futures position.

- 14. Stock Index Futures.** Describe stock index futures. How could they be used by a financial institution that is anticipating a jump in stock prices but does not yet have sufficient funds to purchase large amounts of stock? Explain why stock index futures may reflect investor expectations about the market more quickly than stock prices.

ANSWER: The institution could purchase stock index futures. If the stock market experiences increased prices, the stock index will rise. Thus, the stock index futures position will generate a gain. As new information becomes available, investors can purchase stock index futures with a small up-front payment. The purchase of actual stocks may take longer because a larger investment would be necessary, and because time may be needed to select specific stocks.

- 15. Selling Stock Index Futures.** Why would a pension fund or insurance company consider selling stock index futures?

ANSWER: If a pension fund or insurance company anticipates a temporary decline in stock prices, it may attempt to hedge its stock portfolio by selling stock index futures.

- 16. Systemic Risk.** Explain systemic risk as it relates to the futures market. Explain how the Financial Reform Act of 2010 attempts to monitor systemic risk in the futures market and other markets.

ANSWER: Financial institutions could take excessive risks by speculating in the futures market. If they have agreements over-the-counter, the failure of one party might prevent payment to another

party. This could cause a string of bankruptcies. The Financial Reform Act in 2010 resulted in the creation of the Financial Stability Oversight Council, which is responsible for identifying risks to financial stability in the U.S., and makes regulatory recommendations that could reduce any risks to the financial system. The council consists of 10 members that represent the head of regulatory agencies that regulate key components of the financial system, including the Commodity Futures Trading Commission (CFTC), which regulates financial futures trading.

17. Circuit Breakers. Explain the use of circuit breakers.

ANSWER: Circuit breakers are trading restrictions imposed on specific stocks or stock indices when prices decline abruptly, which prohibit trading for short time periods. This allows investors to determine whether the rumors causing the decline are true, and provides some time to work out credit arrangements if they received a margin call.

Advanced Questions

18. Hedging with Futures. Elon Savings and Loan Association has a large number of 30-year mortgages with floating interest rates that adjust on an annual basis and obtains most of its funds by issuing five-year certificates of deposit. It uses the yield curve to assess the market's anticipation of future interest rates. It believes that expectations of future interest rates are the major force affecting the yield curve. Assume that a downward-sloping yield curve with a steep slope exists. Based on this information, should Elon consider using financial futures as a hedging technique? Explain.

ANSWER: The yield curve reflects expectations of declining interest rates. Since Elon's assets are more rate sensitive than its liabilities, it should consider hedging with financial futures, as it will be adversely affected by declining interest rates. Specifically, Elon would buy financial futures to hedge.

19. Hedging Decision. Blue Devil Savings and Loan Association has a large number of 10-year fixed-rate mortgages and obtains most of its funds from short-term deposits. It uses the yield curve to assess the market's anticipation of future interest rates. It believes that expectations of future interest rates are the major force in affecting the yield curve. Assume that an upward-sloping yield curve exists with a steep slope. Based on this information, should Blue Devil consider using financial futures as a hedging technique? Explain.

ANSWER: Blue Devil should expect interest rates to rise, since the yield curve is upward sloping. Thus, it should sell financial futures to hedge the potential adverse effects of rising interest rates on its spread.

20. How Futures Prices May Respond to Prevailing Conditions. Consider the prevailing conditions for inflation (including oil prices), the economy, the budget deficit, and other conditions that could affect the values of futures contracts. Based on these conditions, would you prefer to buy or sell Treasury bond futures at this time? Would you prefer to buy or sell stock index futures at this time? Assume that you would close out your position at the end of this semester. Offer some logic to support your answers. Which factor is most influential on your decision regarding Treasury bond futures and on your decision regarding stock index futures?

ANSWER: This question is open-ended. It requires students to apply the concepts that were presented in this chapter in order to develop their own view. This question can be useful for class discussion

because it will likely lead to a variety of answers, which reflects the dispersed opinions of market participants.

- 21. Use of Interest Rate Futures When Interest Rates Are Low** Short-term and long-term interest rates are presently very low. You believe that the Fed will use a monetary policy to maintain interest rates at a very low level. Do you think financial institutions that could be adversely affected by a decline in interest rates would benefit from hedging their exposure with interest rate futures? Explain.

ANSWER: The financial institutions with this type of exposure would not benefit much from hedging, because interest rates could not decline much further.

Interpreting Financial News

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

- a. “The existence of financial futures contracts allows our firm to hedge against temporary market declines without liquidating our portfolios.”

Investors can protect their portfolios by selling index futures on the underlying investments that reflect the securities in the investor’s portfolio. By selling futures on indexes, they protect against a temporary decline in values of their securities. Yet, they did not need to sell these securities. Thus, institutional investors can protect their portfolios without major sell-offs of their securities, which may prevent large declines in the prices of their securities.

- b. “Given my confidence in the market, I plan to use stock index futures to increase my exposure to market movements.”

Stock index futures may be purchased by portfolio managers along with other stocks. The futures require only a small initial investment, and yet the value can change substantially. There is much leverage in futures but the investors do not have to purchase the index itself when they take a futures position the way they would with stocks. Instead, they only invest the initial margin, but stand to incur large gains or losses when the futures contracts are closed out. As a result of this leverage, the gains or losses are magnified more than if the manager simply used their funds to purchase stock.

- c. “We used currency futures to hedge the exchange rate exposure of our international mutual fund focused on German stocks.”

A portfolio manager can sell futures contracts on euros to hedge German stock investments. If the euro depreciates against the dollar, the market value of the portfolio (as measured in dollars) is reduced. However, there would be a gain on the futures position, which could help offset the adverse effect on the stock portfolio.

Managing in Financial Markets

As a portfolio manager, you are monitoring previous investments that you made in stocks and bonds of U.S. firms, and in stocks and bonds of Japanese firms. Though you plan to keep all of these investments over the long run, you are willing to hedge against adverse effects on your investments that result from economic conditions. You expect that over the next year, U.S. and Japanese interest rates will decline, the U.S. stock market will perform poorly, the Japanese stock market will perform well, and the Japanese yen (the currency) will depreciate against the dollar.

- a. Should you consider taking a position in U.S. bond index futures to hedge your investment in U.S. bonds? Explain.

No. Interest rates are expected to decline in the United States, so that the investment in U.S. bonds should not be hedged.

- b. Should you consider taking a position in Japanese bond index futures to hedge your investment in Japanese bonds? Explain.

No. Interest rates are expected to decline in the United States, so that the investment in Japanese bonds should not be hedged.

- c. Should you consider taking a position in U.S. stock index futures to hedge your investment in U.S. stocks? Explain.

Yes. You should consider selling U.S. stock index futures to hedge your investments against the expected decline in the U.S. stock market.

- d. Should you consider taking a position in Japanese stock index futures to hedge your investment in Japanese stocks? (Note: The Japanese stock index is denominated in yen, and therefore is used to hedge stock movements, not currency movements).

No. The Japanese stock market is expected to perform well, so a hedge is not needed.

- e. Should you consider taking a position in Japanese yen futures to hedge the exchange rate risk of your investment in Japanese stocks and bonds?

Yes. The Japanese stocks and bonds are denominated in yen. Even if the stocks and bonds perform well from a Japanese perspective, they may be adversely affected from a U.S. perspective by a decline in the value of the yen. Therefore, you should consider selling yen futures contracts to hedge the exchange rate risk.

Problems

- Profit from T-bill Futures.** Spratt Company purchased Treasury bill futures contracts when the quoted price was 93-50. When this position was closed out, the quoted price was 94-75. Determine the profit or loss per contract, ignoring transaction costs.

ANSWER:

Purchase price = \$935,000
 Selling price = \$947,500
 Profit = \$947,500 – \$935,000
 = \$12,500

2. **Profit from T-bill Futures.** Suerth Investments Inc. purchased Treasury bill futures contracts when the quoted price was 95-00. When this position was closed out, the quoted price was 93-60. Determine the profit or loss per contract, ignoring transaction costs.

ANSWER:

Purchase price = \$950,000
 Selling price = \$936,000
 Profit = \$936,000 – \$950,000
 = –\$14,000

3. **Profit from T-bill Futures.** Toland Company sold Treasury bill futures contracts when the quoted price was 94-00. When this position was closed out, the quoted price was 93-20. Determine the profit or loss per contract, ignoring transaction costs.

ANSWER:

Selling price = \$940,000
 Purchase price = \$932,000
 Profit = \$940,000 – \$932,000
 = \$8,000

4. **Profit from T-bill Futures.** Rude Dynamics Inc. sold Treasury bill futures contracts when the quoted price was 93-26. When this position was closed out, the quoted price was 93-90. Determine the profit or loss per contract, ignoring transaction costs.

ANSWER:

Selling price = \$932,600
 Purchase price = \$939,000
 Profit = \$932,600 – \$939,000
 = –\$6,400

5. **Profit from T-bond Futures.** Egan Company purchased a futures contract on Treasury bonds that specified a price of 91-00. When this position was closed out, the price of the Treasury bond futures contract was 90-10. Determine the profit or loss, ignoring transaction costs.

ANSWER:

Purchase price = \$91,000
 Selling price = \$90,312
 Profit = \$90,312 – \$91,000
 = –\$688

6. **Profit from T-bill Futures.** R. C. Clark sold a futures contract on Treasury bonds that specified a price of 92-10. When the position was closed out, the price of Treasury bond futures contract was 93-00. Determine the profit or loss, ignoring transaction costs.

ANSWER:

Selling price = \$92,312
 Purchase price = \$93,000
 Profit = \$92,312 – \$93,000
 = –\$688

7. **Profit from Stock Index Futures.** Marks Insurance Company sold S&P 500 stock index futures that specified an index of 1690. When the position was closed out, the index specified by the futures contract was 1,720. Determine the profit or loss, ignoring transaction costs.

ANSWER:

Selling price = $\$250 \times 1,690 = \$422,500$
 Purchase price = $\$250 \times 1,720 = \$430,000$
 Profit = $\$422,500 - \$430,000$
 = –\$7,500

Flow of Funds Exercise

Hedging With Futures Contracts

Recall that if the economy continues to be strong, Carson Company may need to increase its production capacity by about 50 percent over the next few years to satisfy demand. It would need financing to expand and accommodate the increase in production. Recall that the yield curve is currently upward sloping. Also recall that Carson is concerned about a possible slowing of the economy because of potential Fed actions to reduce inflation. Carson currently relies mostly on commercial loans with floating interest rates for its debt financing.

- a. How could Carson use futures contracts to reduce the exposure of its cost of debt to interest rate movements? Be specific about whether it would use a short hedge or a long hedge.

Carson could sell Treasury bond (or Treasury bill) futures contracts. If interest rates rise, the values of Treasury bonds decrease, and the values of Treasury bond futures contracts decrease. A short position will result in a profit for Carson if interest rates increase, which can offset the higher cost of debt financing.

- b. Will the hedge that you described in the previous question perfectly offset the increase in debt costs if interest rates increase? Explain what drives the profit from the short hedge, versus what drives the higher cost of debt to Carson if interest rates increase.

No. The short position is not a perfect hedge. The profit from the short hedge is influenced by the movement in Treasury security prices, while the cost of debt is influenced by the short-term interest rate on commercial loans (which may be influenced by the rate the banks pay on short-term CDs. There is not a perfect offsetting effect.