

Chapter 7

Bond Markets

Outline

Background on Bonds

Bond Yields

Treasury and Federal Agency Bonds

Treasury Bond Auction
Trading Treasury Bonds
Treasury Bond Quotations
Stripped Treasury Bonds
Inflation-Indexed Treasury Bonds
Savings Bonds
Federal Agency Bonds

Municipal Bonds

Credit Risk
Characteristics of Municipal Bonds
Trading and Quotations
Yields Offered on Municipal Bonds

Corporate Bonds

Corporate Bond Offerings
Characteristics of Corporate Bonds
Corporate Bond Yields and Risk
Secondary Market for Corporate Bonds
Corporate Bond Quotations
Junk Bonds
How Corporate Bonds Facilitate Restructuring
Structured Notes

Institutional Use of Bond Markets

Globalization of Bond Markets

Eurobond Market

Key Concepts

1. Identify the more popular types of bonds, and elaborate where necessary.
2. Provide some opinions on potential problems with using excessive financial leverage, which lead to leveraged buyouts. Explain the role of the bond markets in facilitating corporate capital restructuring.
3. Explain how financial institutions participate in bond markets.

Questions

1. **Bond Indenture.** What is a bond indenture? What is the function of a trustee, as related to the bond indenture?

ANSWER: The bond indenture is a legal document specifying the rights and obligations of both the issuing firm and the bondholders. It is designed to address all matters related to the bond issue, such as collateral, and call provisions.

A trustee represents the bondholders in all matters concerning the bond issue, including the monitoring of the issuing firm's activities to assure compliance with the terms of the indenture.

2. **Sinking-Fund Provision.** Explain the use of a sinking-fund provision. How can it reduce the investor's risk?

ANSWER: A sinking-fund provision is a requirement that the firm retire a certain amount of the bond issue each year. This reduces the payments necessary at maturity and therefore can reduce the risk of investors.

3. **Protective Covenants.** What are protective covenants? Why are they needed?

ANSWER: Protective covenants are restrictions placed on the firm issuing bonds, in order to protect the bondholders. For example, they may limit the dividends or corporate officer salaries, or limit the amount of debt the firm can issue.

Protective covenants are needed to reduce the risk of bonds.

4. **Call Provisions.** Explain the call provision of bonds. How can it affect the price of a bond?

ANSWER: A call provision allows the issuing firm to purchase its bonds back prior to maturity at a specific price (the call price). Investors require a higher yield to compensate for this provision, other things being equal.

5. **Bond Collateral.** Explain the use of bond collateral, and identify the common types of collateral for bonds.

ANSWER: Bond collateral may be established by the bond issuer as a means of backing the bond. If the issuer defaults on the bonds, the investors would have a claim on the collateral.

Some of the more common types of collateral for bonds are mortgages or real property (land and

buildings).

6. Debentures. What are debentures? How do they differ from subordinated debentures?

ANSWER: Debentures are backed only by the general credit of the issuing firm. Subordinated debentures are junior to the claims of regular debentures, and therefore may have a higher probability of default than regular debentures.

7. Zero-Coupon Bonds. What are the advantages and disadvantages to a firm that issues low- or zero-coupon bonds?

ANSWER: From the perspective of the issuing firm, low or zero coupon bonds have the advantage of requiring low or no cash outflow during the life of the bond. The issuing firm is allowed to deduct the amortized discount as interest expense for federal income tax purposes, which adds to the firm's cash flow. However, the lump-sum payment made to bondholders at maturity can be very large, and could cause repayment problems for the firm.

8. Variable-Rate Bonds. Are variable-rate bonds attractive to investors who expect interest rates to decrease? Explain. Would a firm consider variable-rate bonds if it expected that interest rates will decrease? Explain.

ANSWER: If investors expect interest rates to decrease, they would avoid variable-rate bonds because the return to the investors would be tied to market interest rates. The investors would prefer fixed-rate bonds if interest rates are expected to decrease.

If a firm expects that interest rates will decrease, it may consider issuing variable-rate bonds, because the interest paid on the bonds would decline over time with the decline in market interest rates.

9. Convertible Bonds. Why can convertible bonds be issued by firms at a higher price than other bonds?

ANSWER: Convertible bonds allow investors to exchange the bonds for a stated number of shares of the firm's common stock. This conversion feature offers investors the potential for high returns if the price of the firm's common stock rises. Because of this feature, the bonds can be issued at a higher price.

10. Global Interaction of Bond Yields. Assume that bond yields in Japan rise. How might U.S. bond yields be affected? Why?

ANSWER: If bond yields rise in Japan, there may be an increased flow of funds to purchase these bonds. This reduces the amount of funds available to purchase U.S. bonds. Consequently, U.S. bonds will sell at lower prices than before, implying higher yields than before.

11. Impact of FIRREA on the Junk Bond Market. Explain how the Financial Institutions Reform, Recovery and Enforcement Act (FIRREA) could have affected the market value of junk bonds.

ANSWER: FIRREA mandated that the savings institutions liquidate their investments in junk bonds. This caused an increase in the supply of junk bonds for sale, and placed downward pressure on the prices.

12. Calling Bonds. As a result of September 11, 2001, economic conditions were expected to decline. How do you think this would have affected the tendency of firms to call bonds?

ANSWER: When the economy weakens, long-term interest rates typically decline (as they did in this case). Firms can call bonds and re-issue bonds with lower yields under these conditions.

13. Yield Curve for Municipal Securities. Explain how the shape of the yield curve for municipal securities compares to the Treasury yield curve. Under what conditions do you think the two yield curves could be different?

ANSWER: The municipal and Treasury yield curves are very similar, although the yields on municipal securities are lower because of the tax advantage. The shape of both yield curves is influenced by interest rate expectations and risk premiums for longer maturities. The shape of the municipal yield curve could be different from the Treasury yield curve if there are not a lot of municipals being issued in a particular maturity segment. This would result in a low supply of municipal bonds, increasing their price and decreasing their yield.

14. Bond Downgrade. Explain how the downgrading of bonds for a particular corporation affects the corporation, the investors that currently hold these bonds, and other investors who may invest in the bonds in the near future.

ANSWER: If corporate debt is downgraded, the required rate of return by investors would increase, as the bonds are now perceived to have a higher degree of default risk. Consequently, the price of those bonds would drop, resulting in a capital loss for current investors in those bonds. New investors in these bonds can purchase the bonds at a relatively low price, as this low price compensates for their recognition that the default risk of the bonds has increased.

Chapter 8

Bond Valuation and Risk

Outline

Bond Valuation Process

- Impact of the Discount Rate on Bond Valuation
- Impact of the Timing of Payments on Bond Valuation
- Valuation of Bonds with Semiannual Payments

Relationships between Coupon Rate, Required Return, and Bond Price

- Implications for Financial Institutions

Explaining Bond Price Movements

- Factors That Affect the Risk-free Rate
- Factors That Affect the Credit (Default) Risk Premium
- Summary of Factors Affecting Bond Prices
- Bond Market Efficiency

Sensitivity of Bond Prices to Interest Rate Movements

- Bond Price Elasticity
- Duration

Bond Investment Strategies Used by Investors

- Matching Strategy
- Laddered Strategy
- Barbell Strategy
- Interest Rate Strategy

Return and Risk of International Bonds

- Influence of Foreign Interest Rate Movements
- Influence of Credit Risk
- Influence of Exchange Rate Fluctuations
- International Bond Diversification

Key Concepts

1. Explain the logic behind how bond prices are affected by interest rates.
2. Use the bond valuation equations to explain how the sensitivity of bond prices to interest rate movements is a function of bond characteristics (such as maturity and coupon rate).
3. Explain the underlying factors that affect bond prices.

Questions

- 1. Bond Investment Decision.** Based on your forecast of interest rates, would you recommend that investors purchase bonds today? Explain.

ANSWER: Students that expect interest rates to rise should expect bond prices to decline in the future, and therefore not recommend that investors purchase bonds today. Conversely, students that expect interest rates to decrease should expect bond prices to rise in the future, and therefore recommend that investors purchase bonds.

- 2. How Interest Rates Affect Bond Prices.** Explain the impact of a decline in interest rates on:
 - a. An investor's required rate of return.

ANSWER: An investor's required rate of return should decrease.

- b. The present value of existing bonds.

ANSWER: The present value of existing bonds should increase.

- c. The prices of existing bonds.

ANSWER: The prices of existing bonds should increase.

- 3. Relevance of Bond Price Movements.** Why is the relationship between interest rates and bond prices important to financial institutions?

ANSWER: Most financial institutions maintain a portfolio of bonds or mortgages that provide fixed payments over time. Because the market values of these securities are very sensitive to interest rate movements, financial institutions must understand the relationship between interest rates and security prices.

- 4. Source of Bond Price Movements.** Determine the direction of bond prices over the last year and explain the reason for it.

ANSWER: If prices of existing bonds have increased, this is normally because interest rates have declined. If prices of existing bonds have decreased, this is normally because interest rates have increased. A thorough answer would identify factors that caused the interest rates to change.

- 5. Exposure to Bond Price Movements.** How would a financial institution with a large bond portfolio be affected by falling interest rates? Would it be affected more than a financial institution with a greater concentration of bonds (and fewer short-term securities)? Explain.

ANSWER: The market value of the financial institution's bond portfolio will increase. A financial institution that has a greater concentration of bonds would be even more favorably affected because the market value of its portfolio would be more sensitive to interest rates.

- 6. Comparison of Bonds to Mortgages.** Since fixed-rate mortgages and bonds have similar payment

flows, how is a financial institution with a large portfolio of fixed-rate mortgages affected by rising interest rates? Explain.

ANSWER: A financial institution with a large portfolio of fixed-rate mortgages is adversely affected by rising interest rates, because the market value of its mortgage portfolio is reduced.

- 7. Coupon Rates.** If a bond's coupon rate is above its required rate of return, would its price be above or below its par value? Explain.

ANSWER: When a bond's coupon rate is above the required rate of return, the price of the bond would be above its par value because the coupons provide more than the return required.

- 8. Bond Price Sensitivity.** Is the price of a long-term bond more or less sensitive to a change in interest rates than the price of a short-term security? Why?

ANSWER: The price of a long-term bond is more sensitive to a given change in interest rates than the price of a short-term security. The long-term bond provides fixed payments for a longer period of time. Consequently, it will provide these fixed payments, whether interest rates decline or rise. The benefit of fixed payments during a period of falling interest rates is more pronounced for longer maturities. The same is true for the disadvantage of fixed payments during a period of rising rates.

- 9. Required Return on Bonds.** Why does the required rate of return for a particular bond change over time?

ANSWER: The required rate of return on a bond changes because of a change in interest rates, or a change in the risk of the bond.

- 10. Inflation Effects.** Assume that inflation is expected to decline in the near future. How could this affect future bond prices? Would you recommend that financial institutions increase or decrease their concentration in long-term bonds based on this expectation? Explain.

ANSWER: Since lower inflation normally causes a decline in interest rates (other things being equal), financial institutions would benefit if they increase their concentration of long-term bonds before this occurs.

- 11. Bond Price Elasticity.** Explain the concept of bond price elasticity. Would bond price elasticity suggest a higher price sensitivity for zero-coupon bonds or high-coupon bonds that are offering the same yield to maturity? Why? What does this suggest about the market value volatility of mutual funds containing zero-coupon Treasury bonds versus high-coupon Treasury bonds?

ANSWER: Bond price elasticity measures the percentage change in a bond's price in response to a percentage change in interest rates. The percentage change in the price (as measured by present value) of the zero-coupon bonds would be more sensitive to interest rate movements than the high-coupon bonds. Thus, a mutual fund containing zero-coupon bonds would likely have a more volatile market value over time.

- 12. Economic Effects on Bond Prices.** An analyst recently suggested that there will be a major economic expansion, which will favorably affect the prices of high-rated fixed-rate bonds, because the credit risk of bonds will decline as corporations experience better performance. Do you agree with the conclusion of the analyst if the economic expansion occurs? Explain.

ANSWER: The decline in the credit risk will result in slightly lower bond premiums, which would favorably affect the price if other things are held constant. However, the major economic expansion will likely result in higher interest rates, which could cause a major decline in bond prices. The interest rate effect on the bond prices will likely overwhelm the risk premium effect.

- 13. Impact of War.** When tensions rise or war erupts in the Middle East, bond prices in many countries tend to decline. What is the link between problems in the Middle East and bond prices? Would you expect bond prices to decline more in Japan or in the United Kingdom as a result of the crisis? [The answer is tied to how interest rates may change in those countries.] Explain.

ANSWER: The crisis led to an anticipated shortage of oil, which can fuel inflation. Those countries that rely on imported oil would be most affected. Since Japan imports all of its oil while the United Kingdom is self-reliant, Japan's inflation was more susceptible to the crisis. Therefore, Japan's bond prices would be expected to experience a greater decline (which they did).

- 14. Bond Price Sensitivity.** Explain how bond prices may be affected by money supply growth, oil prices, and economic growth.

ANSWER: Any factors that affect inflationary expectations may affect interest rate expectations and therefore affect the demand for bonds. Higher oil prices, excessive money supply growth, and strong economic growth contribute to higher inflationary expectations. Thus, interest rates would be expected to increase under these conditions (holding other factors constant), the demand for bonds would decline, and bond prices would decline. Lower oil prices or a weak economy could reduce inflationary expectations and result in an increased demand for bonds, causing bond prices to rise.

- 15. Impact of Oil Prices.** Assume that oil-producing countries have agreed to reduce their oil production by 30 percent. How would bond prices be affected by this announcement? Explain.

ANSWER: Reduced oil production implies higher oil prices, higher interest rates, and lower bond prices. Thus bond portfolio managers would sell bonds immediately causing immediate downward pressure on the bond prices.

- 16. Impact of Economic Conditions.** Assume that breaking news causes bond portfolio managers to suddenly expect much higher economic growth. How might bond prices be affected by this expectation? Explain. Now assume that breaking news causes bond portfolio managers to suddenly anticipate a recession. How might bond prices be affected? Explain.

ANSWER: Higher economic growth places upward pressure on interest rates and downward pressure on bond prices. As bond portfolio managers sell their bonds based on this expectation, there is immediate downward pressure on bond prices.

A recession tends to imply a reduced demand for loanable funds and therefore lower interest rates and higher prices of existing bonds. As bond portfolio managers purchase bonds to capitalize on this expectation, there is immediate upward pressure on bond prices.

Advanced Questions

17. Impact of the Fed. Assume that the bond market participants suddenly expect the Fed to substantially increase the money supply.

a. Assuming no threat of inflation, how would bond prices be affected by this expectation?

ANSWER: Without the threat of inflation, an increase in the money supply could reduce interest rates and bond prices would increase. Thus, bond portfolio managers would purchase more bonds now, causing immediate upward pressure on bond prices.

b. Assuming that inflation may result, how would bond prices be affected?

ANSWER: If inflation increases, interest rates will likely increase, and prices of existing bonds will decline. Therefore, bond portfolio managers would sell bonds now, causing immediate downward pressure on bond prices.

c. Given your answers to (a) and (b), explain why expectations of the Fed's increase in the money supply may sometimes cause bond market participants to disagree about how bond prices will be affected.

ANSWER: Some bond market participants may expect that the Fed's actions will cause higher inflation (and therefore higher interest rates), and therefore expect bond prices to decline. Other bond market participants may expect that the Fed's actions will not cause higher inflation, and therefore expect bond prices to increase.

18. Impact of the Trade Deficit. Bond portfolio managers closely monitor the trade deficit figures, because the trade deficit can affect exchange rates, which can affect inflationary expectations and therefore interest rates.

- a. When the trade deficit figure is higher than anticipated, bond prices typically decline. Explain why this reaction may occur.

ANSWER: A higher trade deficit figure signals the possibility of continued high trade deficits, which would place downward pressure on the dollar. If the dollar weakens, U.S. inflation may rise, and U.S. interest rates may rise. Thus, bond portfolio managers sell bonds, placing downward pressure on bond prices.

- b. On some occasions, the trade deficit figure has been very large, but the bond markets did not respond to the announcement. Assuming that no other information offset its impact, explain why the bond markets may not have responded to the announcement.

ANSWER: If the large trade deficit was already anticipated by the market, the announcement does not offer any additional information. Therefore, the market does not react. Existing bond prices already reflect the market's expectations.

- 19. International Bonds.** A U.S. insurance company purchased British 20-year Treasury bonds instead of U.S. 20-year Treasury bonds because the coupon rate was 2 percent higher on the British bonds. Assume that the insurance company sold the bonds after five years. Its yield over the five-year period was substantially less than the yield it would have received on the U.S. bonds over the same five-year period. Assume that the U.S. insurance company had hedged its exchange rate exposure. Given that the lower yield was not because of default risk or exchange rate risk, explain how the British bonds could possibly generate a lower yield than the U.S. bonds. (Assume that either type of bond could have been purchased at the par value.)

ANSWER: If British interest rates increased or remained constant while U.S. interest rates declined, the U.S. bonds could have been sold at a much higher price than British bonds. Thus, while default risk and exchange rate risk are not relevant in this case, the interest rate risk had different effects on the two types of bonds.

- 20. International Bonds.** The pension fund manager of Utterback (a U.S. firm) purchased German 20-year Treasury bonds instead of U.S. 20-year Treasury bonds. The coupon rate was 2 percent lower on the German bonds. Assume that the manager sold the bonds after five years. The yield over the five-year period was substantially more than the yield it would have received on the U.S. bonds over the same five-year period. Explain how the German bonds could possibly generate a higher yield than the U.S. bonds for the manager, even if the exchange rate is stable over this five-year period. (Assume that the price of either bond was initially equal to its respective par value). Be specific.

ANSWER: The German interest rates could have declined while U.S. interest rates increased, so that the value of the German bonds was higher than the value of U.S. bonds after five years. Even if interest rates in both countries moved in the same direction, the German bonds could have generated a higher yield. If both interest rates increased, the U.S. interest rates could have increased to a higher degree. If both interest rates decreased, the U.S. interest rates could have decreased by a smaller degree.

- 21. Implications of a Shift in the Yield Curve.** Assume that there is a sudden shift in the yield curve, such that the new yield curve is higher and more steeply sloped today than it was yesterday. If a firm issues new bonds today, would its bonds sell for higher or lower prices than if it had issued the bonds yesterday? Explain.

ANSWER: A higher and steeper yield curve implies that long-term bond yields have increased. The

firm would have to sell the bonds for lower prices to entice investors with a high yield today.

- 22. How Bond Prices May Respond to Prevailing Conditions.** Consider the prevailing conditions for inflation (including oil prices), the economy, the budget deficit, and the Fed's monetary policy that could affect interest rates. Based on prevailing conditions, do you think bond prices will increase or decrease during this semester? Offer some logic to support your answer. Which factor do you think will have the biggest impact on bond prices?

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.

- 23. Interaction Between Bond and Money Markets.** Assume that you maintain bonds and money market securities in your portfolio, and you suddenly believe that long-term interest rates will rise substantially tomorrow (even though the market does not share the same view), while short-term interest rates will remain the same.
- a. How would you rebalance your portfolio between bonds and money market securities?

ANSWER: Based on your expectations, bond prices will decline. You should rebalance your portfolio by selling bonds and purchasing more money market securities.

- b. If the market suddenly recognizes that long-term interest rates will rise tomorrow, and they respond in the same manner as you, explain how the demand for these securities (bonds and money market securities), supply of these securities for sale, and prices and yields of these securities will be affected.

ANSWER: Bond prices will decline, while the prices of money market securities will rise as investors rebalance their portfolios. Consequently, the yield offered on bonds will rise, and the yield offered on money market securities will decline.

- c. Assume that the yield curve is flat today. Explain how the slope of the yield curve will change tomorrow in response to the market activity.

ANSWER: The yield curve will become upward-sloping because the yield offered on bonds will rise, while the yield offered on money market securities will decline.

Problems

- 1. Bond Valuation.** Assume the following information for an existing bond that provides annual coupon payments:
- Par value = \$1,000
 - Coupon rate = 11%
 - Maturity = 4 years
 - Required rate of return by investors = 11%
- a. What is the present value of the bond?

ANSWER:

$$\begin{aligned}
PV \text{ of Bond} &= PV \text{ of Coupon Payments} + PV \text{ of Principal} \\
&= \$110(PVIFA_{i=11\%,n=4}) + \$1,000(PVIF_{i=11\%,n=4}) \\
&= \$110(3.1024) + \$1,000(.6587) \\
&= \$341 + \$659 \\
&= \$1,000
\end{aligned}$$

- b. If the required rate of return by investors were 14 percent instead of 11 percent, what would be the present value of the bond?

ANSWER:

$$\begin{aligned}
PV \text{ of Bond} &= PV \text{ of Coupon Payments} + PV \text{ of Principal} \\
&= \$110(PVIFA_{i=14\%,n=4}) + \$1,000(PVIF_{i=14\%,n=4}) \\
&= \$110(2.9137) + \$1,000(.5921) \\
&= \$321 + \$592 \\
&= \$913
\end{aligned}$$

- c. If the required rate of return by investors were 9 percent, what would be the present value of the bond?

ANSWER:

$$\begin{aligned}
PV \text{ of Bond} &= PV \text{ of Coupon Payments} + PV \text{ of Principal} \\
&= \$110(PVIFA_{i=9\%,n=4}) + \$1,000(PVIF_{i=9\%,n=4}) \\
&= \$110(3.2397) + \$1,000(.7084) \\
&= \$356 + \$708 \\
&= \$1,064
\end{aligned}$$

2. **Valuing a Zero-Coupon Bond.** Assume the following information for existing zero-coupon bonds:

Par value = \$100,000

Maturity = 3 years

Required rate of return by investors = 12%

How much should investors be willing to pay for these bonds?

ANSWER:

$$\begin{aligned}
PV \text{ of Bond} &= PV \text{ of Coupon Payments} + PV \text{ of Principal} \\
&= \$0 + 100,000(PVIF_{i=12\%,n=3}) \\
&= \$100,000(.7118) \\
&= \$71,180
\end{aligned}$$

3. **Valuing a Zero-Coupon Bond.** Assume that you require a 14 percent return on a zero-coupon bond with a par value of \$1,000 and six years to maturity. What is the price you should be willing to pay for this bond?

ANSWER:

$$\begin{aligned}
PV \text{ of Bond} &= PV \text{ of Coupon Payments} + PV \text{ of Principal} \\
&= \$0 + 1,000(PVIF_{i=14\%,n=6}) \\
&= \$1,000(.4556) \\
&= \$455.60
\end{aligned}$$

4. **Bond Value Sensitivity to Exchange Rates and Interest Rates.** Cardinal Company, a U.S.-based insurance company, considers purchasing bonds denominated in Canadian dollars, with a maturity of six years, a par value of C\$50 million, and a coupon rate of 12 percent. The bonds can be purchased at par by Cardinal and would be sold four years from now. The current exchange rate of the Canadian dollar is \$0.80. Cardinal expects that the required return by Canadian investors on these bonds four years from now will be 9 percent. If Cardinal purchases the bonds, it will sell them in the Canadian secondary market four years from now. The exchange rates are forecast as follows:

<u>Year</u>	<u>Exchange Rate of C\$</u>
1	\$0.80
2	0.77
3	0.74
4	0.72
5	0.68
6	0.66

- a. Refer to earlier examples in this chapter to determine the expected U.S. dollar cash flows to Cardinal over the next four years. Refer to Chapter 3 to determine the present value of a bond.

ANSWER:

$$\begin{aligned}
 \text{Cash Flows} &= \frac{\text{C\$6,000,000}}{(1 + .09)^1} + \frac{\text{C\$56,000,000}}{(1 + .09)^2} \\
 &\quad \text{in 4 years} \\
 &= \text{C\$5,504,587} + \text{C\$47,134,080} \\
 &= \text{C\$52,638,667}
 \end{aligned}$$

<u>Year</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
C\$ cash flows anticipated	C\$6,000,000	C\$6,000,000	C\$6,000,000	C\$6,000,000 +C\$52,638,667
Forecasted exchange rate of C\$	\$0.80	\$0.77	\$0.74	\$0.72
U.S. \$ cash flows anticipated	\$4,800,000	\$4,620,000	\$4,440,000	\$42,219,840

- b. Does Cardinal expect to be favorably or adversely affected by the interest rate risk? Explain.

ANSWER: Cardinal Co. will be favorably affected if Canadian interest rates decline as expected because the bonds will sell for a higher price at the end of the fourth year as a result.

- c. Does Cardinal expect to be favorably or adversely affected by exchange rate risk? Explain.

ANSWER: Cardinal Co. is adversely affected by the exchange rate movements, because a weaker Canadian dollar over time results in less U.S. dollar cash flows to be received.

5. **Predicting Bond Values.** (Use the chapter appendix to answer this problem.) Bulldog Bank has just purchased bonds for \$106 million that have a par value of \$100 million, three years remaining to

maturity, and an annual coupon rate of 14 percent. It expects the required rate of return on these bonds to be 12 percent one year from now.

a. At what price could Bulldog Bank sell these bonds for one year from now?

ANSWER:

$$\begin{aligned}
 \text{PV of Bonds One Year from Now} &= \text{PV of Remaining} \\
 &= \text{Coupon Payments} + \text{PV of Principal} \\
 &= \$14,000,000(PVIFA_{i=12\%,n=2}) + \$100,000,000(PVIF_{i=12\%,n=2}) \\
 &= \$14,000,000(1.6901) + \$100,000,000(.7972) \\
 &= \$23,661,400 + \$79,720,000 \\
 &= \$103,381,400
 \end{aligned}$$

b. What is the expected annualized yield on the bonds over the next year, assuming they are to be sold in one year?

ANSWER:

$$\begin{aligned}
 \$106,000,000 &= (\$14,000,000 + \$103,381,400)(PVIF_{i=?n=1}) \\
 .903 &= (PVIF_{i=?n=1}) \\
 i &= \text{between } 10\% \text{ and } 11\%
 \end{aligned}$$

6. Predicting Bond Values. (Use the chapter appendix to answer this problem.) Sun Devil Savings has just purchased bonds for \$38 million that have a par value of \$40 million, five years remaining to maturity, and a coupon rate of 12 percent. It expects the required rate of return on these bonds to be 10 percent two years from now.

a. At what price could Sun Devil Savings sell these bonds for two years from now?

ANSWER:

$$\begin{aligned}
 \text{PV of Bonds in 2 Years} &= \text{PV of Remaining} \\
 &= \text{Coupon Payments} + \text{PV of Principal} \\
 &= \$4,800,000(PVIFA_{i=10\%,n=3}) + \$40,000,000(PVIF_{i=10\%,n=3}) \\
 &= \$4,800,000(2.4869) + \$40,000,000(.7513) \\
 &= \$11,937,120 + \$30,052,000 \\
 &= \$41,989,120
 \end{aligned}$$

b. What is the expected annualized yield on the bonds over the next two years, assuming they are to be sold in two years?

ANSWER:

$$\$38,000,000 = \$4,800,000(PVIFA_{i=?n=2}) + (\$41,989,120)(PVIF_{i=?n=2})$$

By trial and error, i = about 17%.

This can also be done with some calculators.

c. If the anticipated required rate of return of 10 percent in two years is overestimated, how would the actual selling price differ from the forecasted price? How would the actual annualized yield

over the next two years differ from the forecasted yield?

ANSWER: If the required rate of return is overestimated, then the actual selling price will be higher than what is forecasted. Therefore, the annualized yield will be higher than what is forecasted.

- 7. Predicting Bond Values.** (Use the chapter appendix to answer this problem.) Spartan Insurance Company plans to purchase bonds today that have four years remaining to maturity, a par value of \$60 million, and a coupon rate of 10 percent. Spartan expects that in three years, the required rate of return on these bonds by investors in the market will be 9 percent. It plans to sell the bonds at that time. What is the expected price it will sell the bonds for in three years?

ANSWER:

$$\begin{aligned}
 \text{PV of Bonds in 3 Years} &= \text{PV of Remaining Coupon Payments} + \text{PV of Principal} \\
 &= (\$6,000,000 + \$60,000,000)(PVI_{i=9\%,n=1}) \\
 &= \$66,000,000(.9174) \\
 &= \$60,548,400
 \end{aligned}$$

- 8. Bond Yields.** (Use the chapter appendix to answer this problem.) Hankla Company plans to purchase either (1) zero-coupon bonds that have ten years to maturity, a par value of \$100 million, and a purchase price of \$40 million, *or* (2) bonds with similar default risk that have five years to maturity, a 9 percent coupon rate, a par value of \$40 million, and a purchase price of \$40 million.

Hankla can invest \$40 million for five years. Assume that the market's required return in five years is forecasted to be 11 percent. Which alternative would offer Hankla a higher expected return (or yield) over the five-year investment horizon?

ANSWER: The PV of zero-coupon bonds five years from now is based on the PV of the par value to be received 5 years after that point in time:

$$\begin{aligned}
 \text{PV of Zero-Coupon Bonds} &= \$100,000,000(PVI_{i=11\%,n=5}) \\
 &= \$100,000,000(.5935) \\
 &= \$59,350,000
 \end{aligned}$$

The discount rate at which the anticipated cash flows from the zero-coupon bonds will equal today's price is:

$$\begin{aligned}
 \$40,000,000 &= \$59,350,000(PVI_{i=?,n=5}) \\
 (PVI_{i=?,n=5}) &= .6740 \\
 i &= \text{about } 8\%
 \end{aligned}$$

The second alternative offers a yield to maturity of 9 percent, which exceeds the yield to maturity of about 8 percent on the zero-coupon bonds.

- 9. Predicting Bond Values.** (Use the chapter appendix to answer this problem.) The portfolio manager of Ludwig Company has excess cash that is to be invested for four years. He can purchase four-year Treasury notes that offer a 9 percent yield. Alternatively, he can purchase new 20-year Treasury bonds for \$2.9 million that offer a par value of \$3 million and an 11 percent coupon rate with annual payments. The manager expects that the required return on these same 20-year bonds will be 12

percent four years from now.

- a. What is the forecasted market value of the twenty-year bonds in four years?

ANSWER:

$$\begin{aligned} \text{PV of 20-Year Bonds as of 4 Years from Now} &= \text{PV of Remaining Coupon Payments} + \text{PV of Principal} \\ &= \$330,000(PVIFA_{i=12\%,n=16}) + \$3,000,000(PVIF_{i=12\%,n=16}) \\ &= \$330,000(6.9740) + \$3,000,000(.1631) \\ &= \$2,301,420 + \$489,300 \\ &= \$2,790,720 \end{aligned}$$

- b. Which investment is expected to provide a higher yield over the four-year period?

ANSWER: Ludwig could achieve a yield of 9 percent on the Treasury notes with certainty. By discounting the cash flow resulting from the alternative investment (20-year bonds) over the four-year investment horizon at 9 percent, we can determine whether the bonds offer a higher or lower yield. The *PV* of the bonds as of today using a 9 percent discount rate is:

$$\begin{aligned} &= \$330,000(PVIFA_{i=9\%,n=4}) + \$2,790,720(PVIF_{i=9\%,n=4}) \\ &= \$330,000(3.2397) + \$2,790,720(.7084) \\ &= \$1,069,101 + \$1,976,946 \\ &= \$3,046,047 \end{aligned}$$

Since Ludwig would pay less today for these bonds than the present value estimated here, this implies that the yield to maturity on the bonds exceeds 9 percent. Therefore, the bonds offer a higher yield.

10. Valuing a Zero-Coupon Bond.

- a. A zero-coupon bond with a par value of \$1,000 matures in 10 years. At what price would this bond provide a yield to maturity that matches the current market rate of 8 percent?

ANSWER:

$$\begin{aligned} PV &= \frac{C}{(1+k)^t} \\ PV &= \frac{1,000}{(1+0.08)^{10}} \\ PV &= \$463.19 \end{aligned}$$

- b. What happens to the price of this bond if interest rates fall to 6 percent?

ANSWER:

$$PV = \frac{C}{(1+k)^t}$$

$$PV = \frac{1,000}{(1 + 0.06)^{10}}$$

$$PV = \$558.39$$

- c. Given the above changes in the price of the bond and the interest rate, calculate the bond price elasticity.

ANSWER:

$$\begin{aligned} P^e &= \frac{\text{percent change in } P}{\text{percent change in } k} \\ &= \frac{\$558.39 - \$463.19}{\frac{\$463.19}{8\%}} \\ &= \frac{0.20553}{-0.25} \\ &= -0.822 \end{aligned}$$

Chapter 10

Stock Offerings and Investor Monitoring

Outline

Private Equity

- Financing by Venture Capital Funds
- Financing by Private Equity Funds

Public Equity

- Ownership and Voting Rights
- Preferred Stock
- Participation in Stock Markets

Initial Public Offerings

- Process of Going Public
- Underwriter Efforts to Ensure Price Stability
- Timing of IPOs
- Initial Returns of IPOs
- Google's IPO
- Abuses in the IPO Market
- Long-Term Performance Following IPOs
- Impact of the Sarbanes-Oxley Act on IPOs

Secondary Stock Offerings

- Shelf-Registration

Stock Exchanges

- Organized Exchanges
- Over-the-Counter Market
- Electronic Stock Exchanges
- Extended Trading Sessions
- Stock Quotations Provided by Exchanges
- Stock Index Quotations

Monitoring by Investors

- Accounting Irregularities
- Sarbanes-Oxley Act
- Shareholder Activism
- Shareholder Lawsuits

Monitoring by Financial Managers

- Stock Repurchases
- Market for Corporate Control
- Barriers to the Market for Corporate Control

Globalization of Stock Markets

- Foreign Stock Offerings in the United States
- International Placement Process
- Global Stock Exchanges
- Emerging Stock Markets
- Methods Used to Invest in Foreign Stocks

Key Concepts

1. Identify the various types of stock.
2. Describe the process of an engaging in an initial public offering.
3. Describe the process of engaging in a secondary offering.
4. Explain how firms are monitored within the stock market.

Questions

1. **Shareholder Rights.** Explain the rights of common stockholders that are not available to other individuals.

ANSWER: Common stockholders are permitted to vote on key matters concerning the firm such as the election of the board of directors, authorization to issue new shares of common stock, approval of amendments to the corporate charter, and adoption of by-laws.

2. **Stock Offerings.** What is the danger of issuing too much stock? What is the role of the investment bank that serves as the underwriter, and how can it ensure that the firm does not issue too much stock?

ANSWER: The issuance of too much stock can cause dilution of ownership, and can depress stock prices because the supply of stock may now exceed demand.

Investment banking firms distribute or place stock for corporations. They serve as intermediaries since corporations issuing stock typically do not have the expertise to place their own stock. They have experience to know how much stock can be digested by the market.

3. **IPOs.** Why do firms engage in IPOs? What is the amount of fees that the lead underwriter and its syndicate charge a firm that is going public? Why are there many IPOs in some periods and few IPOs in other periods?

ANSWER: Firms engage in IPOs when they have feasible expansion plans but are already near their debt capacity.

The transaction cost (fees) is normally about 7 percent of the gross proceeds received by the issuing firm.

Firms prefer to engage in IPOs when business conditions and market conditions are favorable. They avoid IPOs if business conditions are poor, because they do not need funds to expand if the business outlook is poor. Also, when business conditions are poor, the market conditions are weak, meaning that they would have to sell their shares at a low price.

- 4. Venture Capital.** Explain the difference between obtaining funds from a venture capital firm and engaging in an IPO. Explain how the IPO may serve as a means by which the venture capital firm can cash out.

ANSWER: Before a firm engages in an IPO, it may obtain equity funding from a venture capital firm for a period of two to five years. An IPO allows other shareholders to invest in the equity of the firm.

Venture capital firms tend to sell off their shares shortly after the firm engages in an IPO. After the shares are publicly traded, the venture capital firm may sell its shares in the secondary market.

- 5. Prospectus and Road Show.** Explain the use of a prospectus developed before an IPO. Why does a firm do a road show before its IPO? What factors influence the offer price of stock at the time of the IPO?

ANSWER: A prospectus specifies how the proceeds of the offering are to be used, the past performance of the issuing firm, the risk involved in the firm's business, and the price range in which the shares will be offered.

The firm does a road show to promote its offering. That is, it explains to various institutional investors how it will use the funds to support its expansion. The goal of the road show is to convince some large investors to invest in the shares of the firm.

The offer price is influenced by market conditions, industry conditions, and the prevailing market multiples (such as price/earnings ratio). Firms prefer to engage in an IPO when market conditions allow for a high offer price.

- 6. Bookbuilding.** Describe the process of bookbuilding. Why is bookbuilding sometimes criticized as a means of setting the offer price?

ANSWER: The lead underwriter engages in bookbuilding by soliciting indications of interest in the IPO by institutional investors, so as to determine demand. The bookbuilding process used in the United States is sometimes criticized because it dictates an offer price that is lower than what some institutional investors would pay.

- 7. Lockups.** Describe a lockup provision and explain why it is required by the lead underwriter.

ANSWER: Describe the pressure of the share price at the lockup expiration date. The lockup provision restricts insiders and venture capital firms from selling their shares until a specified period (usually 6 months) after the IPO. Once the lockup provision expires, the insiders and venture capital firms can sell the shares that they own, which sometimes places downward pressure on the price of

the stock at that time.

- 8. Initial Return.** What is the meaning of an initial return for an IPO? Were initial returns of Internet IPOs in the late 1990s higher or lower than normal? Why?

ANSWER: The initial return is the return from the offer price until the end of the first day of trading. The initial returns of Internet IPOs in the late 1990s were high, because many investors wanted to invest in them.

- 9. Flipping.** What is the meaning of “flipping” shares? Why would investors want to flip shares?

ANSWER: Flipping shares refers to selling shares shortly after (such as a day or two) obtaining them at the IPO. Some institutional investors attempt to flip shares to take advantage of an initial return over the first day. IPO performance tends to be unusually high on the first day, followed by a downward drift. Some investors want to earn the initial return and then sell out. They may earn a very high return without tying their funds up for a long period of time.

- 10. Performance of IPOs.** How do IPOs perform over the long run?

ANSWER: IPOs perform poorly on average when compared to other firms over the long-term period.

- 11. Asymmetric Information.** Discuss the concept of asymmetric information and explain how it may cause corporate managers to serve as investors.

ANSWER: A firm’s managers have information about their firm that outside investors do not have. Therefore, they may be in a better position to value the shares than outside investors. If they believe the market value of the shares is too low, they may repurchase shares.

- 12. Stock Repurchases.** Explain why the stock price of a firm may rise when the firm announces that it is repurchasing its shares.

ANSWER: A stock repurchase signals to other investors that the firm’s managers believe the stock is undervalued. Therefore, they purchase the stock, which places upward pressure on the stock’s price.

- 13. Corporate Control.** Describe how the interaction between buyers and sellers affects the market value of a firm, and explain how that can subject a firm to the market for corporate control.

ANSWER: If a firm’s business performance is weak, investor demand for shares will typically be weak, and the firm’s stock price will be weak. Another firm’s managers may consider purchasing the weak firm at its prevailing weak price, and then improving that firm’s performance by replacing managers and reorganizing that firm. Managers of the weak firm have an incentive to improve their firm to prevent the firm from being acquired.

- 14. ADRs.** Explain how ADRs enable U.S. investors to become part owners of foreign companies.

ANSWER: American depository receipts (ADRs) are certificates that represent ownership of a foreign stock. They are traded in the United States. U.S. investors can purchase ADRs as a method of investing in foreign securities.

- 15. NYSE.** Explain why stocks traded on the NYSE exhibit lower risk than stocks that are traded on other exchanges.

ANSWER: Stocks traded on the NYSE tend to represent larger firms. These stocks also have a large trading volume, which enhances their liquidity.

- 16. Role of Organized Exchanges.** Are organized stock exchanges used to place newly issued stock? Explain.

ANSWER: Organized exchanges are used to facilitate secondary market transactions. They are not used to place newly issued stock.

Advanced Questions

- 17. Role of IMFs.** How have international mutual funds (IMFs) increased the international integration of capital markets among countries?

ANSWER: International mutual funds (IMFs) have allowed investors easy access to foreign securities, since the firm sponsoring the IMFs makes the portfolio decisions and executes the transactions. Even small investors can easily invest in foreign securities by purchasing shares of IMFs. Consequently, international capital markets have become more integrated.

- 18. Spinning and Laddering.** Describe spinning and laddering in the IPO market. How do you think these actions influence the price of a newly issued stock? Who is adversely affected as a result of these actions?

ANSWER: Spinning is the process in which an investment bank allocates shares from an IPO to corporate executives who may be considering an IPO or other business that would require the help of an investment bank. Laddering involves investors placing bids for IPO shares on the first day that are above the offer price.

Laddering ultimately results in upward price momentum, which may or may not accurately reflect the fair value of the underlying stock. If spinning occurs at favorable stock prices, this may keep the stock price from achieving its fair value.

The initial owners of the firm may be adversely affected because the firm may not receive as much proceeds from the IPO due to spinning and laddering. Spinning may result in shares sold at a lower than market price. Laddering might only occur if there is an unusually strong demand for the shares. If there is such a strong demand, the IPO price must be too low.

- 19. Impact of Accounting Irregularities.** How do you think accounting irregularities affect the pricing of corporate stock in general? From an investor's viewpoint, how do you think the information used to price stocks changes given that accounting irregularities exist?

ANSWER: Generally speaking, accounting irregularities introduce additional uncertainty and risk. Consequently, investors would require a higher rate of return, which would result in a lower stock price.

The existence of accounting irregularities probably results in closer scrutiny of financial statements for investors. Furthermore, investors will probably seek additional sources of information and opinions in addition to the firm's financial statements as part of their decision-making process.

20. Impact of Sarbanes-Oxley Act. Briefly describe the provisions of the Sarbanes-Oxley Act. Discuss how this act affects the monitoring by shareholders.

ANSWER: The Sarbanes-Oxley Act:

- 1) Prevents a public accounting firm from auditing a client firm whose employees were employed by the client firm within one year prior to the audit.*
- 2) Requires that only outside board members of a firm be on the firm's audit committee.
 - 3) Prevents the members of a firm's audit committee from receiving consulting or advising fees or other compensation from the firm beyond that earned from serving on the board.*
 - 4) Requires that the CEO and CFO of firms that are of at least a specified size level to certify that the audited financial statements are accurate.*
- 5) Specified major fines or imprisonment for employees who mislead investors or hide evidence.
 - 6) Prevents public accounting firms from offering non-audit services to an audit client if the client's audit committee pre-approves the non-audit services to be rendered before the audit begins.*

The Act prevents accounting irregularities by firms and should improve the ability of shareholders to monitor firms.

Problem

1. Dividend Yield. Over the last year, Calzone Corporation paid a quarterly dividend of \$0.10 in each of the four quarters. The current stock price of Calzone Corporation is \$39.78. What is the dividend yield for Calzone stock?

ANSWER:

$$\text{Dividend yield} = \frac{4 \times \$0.10}{\$39.78} = 1.01\%$$

Chapter 11

Stock Valuation and Risk

Outline

Stock Valuation Methods

- Price-Earnings (PE) Method
- Dividend Discount Model
- Adjusting the Dividend Discount Model
- Free Cash Flow Model

Determining the Required Rate of Return to Value Stocks

- Capital Asset Pricing Model
- Arbitrage Pricing Model

Factors That Affect Stock Prices

- Economic Factors
- Market-Related Factors
- Firm-Specific Factors
- Integration of Factors Affecting Stock Prices

Role of Analysts in Valuing Stocks

- Analyst Conflicts of Interest
- Inside Information
- Unbiased Analyst Ratings Services

Stock Risk

- Measures of Risk

Applying Value at Risk

- Methods of Determining the Maximum Expected Loss
- Deriving the Maximum Dollar Loss
- Common Adjustments to the Value-at-Risk Applications

Forecasting Stock Price Volatility and Beta

- Methods of Forecasting Stock Price Volatility
- Forecasting a Stock Portfolio's Volatility
- Forecasting a Stock Portfolio's Beta

Stock Performance Measurement

- Sharpe Index
- Treynor Index

Stock Market Efficiency

- Forms of Efficiency
- Tests of the Efficient Market Hypothesis

Foreign Stock Valuation, Performance, and Efficiency

- Valuation of Foreign Stocks
- Measuring Performance from Investing in Foreign Stocks
- Performance from Global Diversification
- International Market Efficiency

Key Concepts

1. Explain stock valuation models.
2. Explain how to assess the risk of stocks and stock portfolios.

Questions

1. **Price-Earnings Model.** Explain the use of the price-earnings (PE) ratio for valuing a stock. Why might investors derive different valuations for a stock when using the price-earnings method? Why might investors derive an inaccurate valuation of a firm when using the price-earnings method?

ANSWER: Investors can value a stock by applying the industry PE ratio to the firm's expected earnings for the next year. This method implicitly assumes that the growth in earnings in future years will be similar to that of the industry.

This method has several variations, which can result in different valuations. For example, investors may use different forecasts for the firm's earnings or the mean industry earnings over the next year. The previous year's earnings are often used as a base for forecasting future earnings, but the recent year's earnings do not always provide an accurate forecast of the future.

A second reason for different valuations when using the PE method is that investors disagree on the proper measure of earnings. Some investors prefer to use operating earnings, or exclude some unusually high expenses that result from one-time events. A third reason is that investors may disagree on the firms that should represent the industry norm. Some investors use a narrow industry composite composed of firms that are very similar (in terms of size, lines of business, etc.) to the firm being valued; other investors prefer a broad industry composite. Consequently, even if investors agree on a firm's forecasted earnings, they may still derive different values for that firm as a result of applying different PE ratios. Furthermore, even if investors agree on the firms to include, they may disagree on how to weight each firm.

2. **Dividend Discount Model.** Describe the dividend discount valuation model. What are some limitations of the dividend discount model?

ANSWER: The dividend discount valuation model measures the value of a firm as the present value of future expected dividends to be received by the investor. The model can account for uncertainty by allowing dividends to be revised in response to revised expectations about a firm's cash flows, or by allowing the required rate of return to be revised in response to changes in the required rate of return

by investors.

The dividend discount model may result in an inaccurate valuation of a firm because of potential errors in determining the dividend to be paid over the next year, or the growth rate, or the required rate of return by investors. The limitations of this model are more pronounced when valuing firms that retain most of their earnings rather than distribute them as dividends, because the model relies on the dividend as the base for applying the growth rate. For example, many Internet-related stocks retain any earnings to support growth and thus are not expected to pay any dividends.

3. Impact of Economic Growth. Explain how economic growth affects the valuation of a stock.

ANSWER: The firm's value should reflect the present value of its future cash flows. Because earnings are a primary component of corporate cash flows, many investors use forecasted earnings to determine whether a firm's stock is over- or undervalued.

4. Impact of Interest Rates. How are the interest rate, the required rate of return on a stock, and the valuation of a stock related?

ANSWER: Given a choice of risk-free Treasury securities or stocks, stocks should be purchased only if they are appropriately priced to reflect a sufficiently high expected return above the risk-free rate.

The relation between interest rates and stock prices is not constant over time. However, most of the largest stock market declines have occurred in periods when interest rates increased substantially. Furthermore, the stock market's rise in the late 1990s is partially attributed to the low interest rates during that period, which encouraged investors to shift from debt securities (with low rates) to equity securities.

5. Impact of Inflation. Assume that the expected inflation rate has just been revised upward by the market. Would the required return by investors who invest in the stocks be affected? Explain.

ANSWER: An increase in expected inflation can increase the risk-free interest rate, which is a key component of the required rate of return on stocks. Therefore, it should cause an increase in the required rate of return on stocks.

6. Impact of Exchange Rates. Explain how the value of the dollar affects stock valuations.

ANSWER: The value of the dollar can affect U.S. stock prices for a variety of reasons. First, foreign investors tend to purchase U.S. stocks when the dollar is weak and sell them when it is near its peak. Thus, the foreign demand for any given U.S. stock may be higher when the dollar is expected to strengthen, other things being equal. Also, stock prices are affected by the impact of the dollar's changing value on cash flows. Stock prices of U.S. firms primarily involved in exporting could be favorably affected by a weak dollar and adversely affected by a strong dollar. U.S. importing firms could be affected in the opposite manner. Stock prices of U.S. companies may also be affected by exchange rates if stock market participants measure performance by reported earnings. A multinational corporation's consolidated reported earnings will be affected by exchange rate fluctuations even if the company's cash flows are not affected. A weaker dollar tends to inflate the reported earnings of a U.S.-based company's foreign subsidiaries. Some analysts argue that any effect of exchange rate movements on financial statements is irrelevant unless cash flows are also affected.

The changing value of the dollar can also affect stock prices by affecting expectations of economic factors that influence the firm's performance. For example, if a weak dollar stimulates the U.S. economy, it may enhance the value of a U.S. firm whose sales are dependent on the U.S. economy. A

strong dollar could adversely affect such a firm if it dampens U.S. economic growth. Because inflation affects some firms, a weak dollar value could indirectly affect a firm's stock by putting upward pressure on inflation. A strong dollar would have the opposite indirect impact.

7. Investor Sentiment. Explain why investor sentiment can affect stock prices.

ANSWER: Investor sentiment represents the general mood of investors in the stock market. Since the stock valuations reflect expectations, there are some periods in which the stock market performance is not highly correlated with existing economic conditions. For example, stock prices may rise when the economy is weak if most investors expect that the economy will improve in the near future.

8. January Effect. Describe the January effect.

ANSWER: Because many portfolio managers are evaluated over the calendar year, they tend to invest in riskier small stocks at the beginning of the year and shift to larger (more stable) companies near the end of the year to lock in their gains. This tendency places upward pressure on small stocks in January of every year, causing the so-called January effect.

9. Earnings Surprises. How do earnings surprises affect valuations of stocks?

ANSWER: Favorable earnings surprises increase the values of stocks. Negative earnings surprises decrease the values of stocks.

10. Impact of Takeover Rumors. Why can expectations of an acquisition affect the value of the target's stock?

ANSWER: The expected acquisition of a firm typically results in an increased demand for the target's stock and therefore raises the stock price. Investors recognize that the target's stock price will be bid up once the acquiring firm attempts to acquire the target's stock.

11. Analyst Recommendations. How do analyst recommendations affect stock valuations?

ANSWER: Stock analysts who are employed by securities firms or other financial firms play an important role in the market valuation of stocks. Through their recommendations, they influence the buying or selling decisions of some investors, and therefore can influence the price of stocks. Many analysts are assigned to specific stocks and provide ratings that can indicate whether investors should buy the stock, or sell the stock.

12. Analyst Conflicts of Interest. What conflicts of interest are faced by many analysts who rate stocks?

ANSWER: First, many analysts are often employed by securities firms that have other investment banking relationships with the firms that they rate, such as facilitating mergers or secondary offerings of stock. A firm will not normally seek the services of an investment bank whose analysts rate it as a "sell." It would prefer to hire an investment bank that has a more favorable opinion of it, because the services it may need from an investment bank will be more favorable if the investment bank's valuation of the firm is relatively high.

Another conflict of interest is that analysts may own the stock of some of the firms that they rate. If they own a specific stock, they may refrain from making any negative comments about the stock while they own it, with the hope that the stock's price will rise even higher.

13. Stock Portfolio Volatility. Identify the factors that affect a stock portfolio's volatility and explain

their effects.

ANSWER: A stock portfolio has more volatility when its individual stock volatilities are high, other factors held constant. In addition, a stock portfolio has more volatility when its individual stock returns are highly correlated, other factors held constant. A stock portfolio containing some stocks with low or negative correlation will exhibit less volatility because the stocks will not experience peaks and troughs simultaneously. Some offsetting effects will occur, smoothing the returns of the portfolio over time.

- 14. Beta.** Explain how to estimate the beta of a stock. Explain the logic regarding how beta serves as a measure of the stock's risk.

ANSWER: The beta of a stock can be estimated by obtaining returns of the firm and the stock market over the last 12 quarters and applying regression analysis to derive the slope coefficient as in this model:

$$R_{jt} = B_0 + B_1R_{mt} + u_t$$

where R_{jt} = return of stock j in time t

R_{mt} = market return

B_0 = intercept

B_1 = regression coefficient that serves as an estimate of beta

u_t = error term

Some investors or analysts prefer to use monthly returns rather than quarterly returns to estimate the beta. The choice is dependent on the holding period for which one wants to assess sensitivity. If the goal is to assess sensitivity to monthly returns, then monthly data would be more appropriate.

The regression analysis estimates the intercept (B_0) and the slope coefficient (B_1), which serves as the estimate of beta.

Beta serves as a measure of the stock's risk because it measures sensitivity to the market. The higher the sensitivity, the more likely that the stock will perform poorly under adverse market conditions.

- 15. Wall Street.** In the movie *Wall Street*, Bud Fox is a broker who conducts trades for Gordon Gekko's firm. Gekko purchases shares of firms he believes are undervalued. Various scenes in the movie offer excellent examples of concepts discussed in this chapter.

- a. Bud Fox makes the comment to Gordon Gekko that a firm's breakup value is twice its market price. What is Bud suggesting in this statement? How would employees of the firm respond to Bud's statement?

ANSWER: Bud is suggesting that the firm could be acquired and separated into divisions and sold to various firms. The combined value of the individual divisions (when sold) would be worth more than the firm's prevailing market value. Employees of a firm are concerned about comments like this because it means that they may be subject to reorganization (although some employees might benefit from this).

- b. Once Bud informs Gekko that another investor, Mr. Wildman, is secretly planning to acquire a target firm in Pennsylvania, Gekko tells Bud to buy a large amount of this stock. Why?

ANSWER: Gekko wants to accumulate much of the stock before Mr. Wildman attempts to acquire the target. In this way, Wildman will need to purchase stock from Gekko at a premium to obtain those shares held by Gekko. This strategy is known as greenmail.

- c. Gekko states “Wonder why fund managers can’t beat the S&P 500? Because they are sheep.” What is Gekko’s point? How does it relate to market efficiency?

ANSWER: Gekko is implying that all fund managers use the same type of information, which is already known by the market. The market prices should already reflect that information. Gekko focuses on obtaining information that is not known by the market to outperform other investors in the market.

- 16. Market Efficiency.** Explain the difference between weak-form, semistrong-form, and strong-form efficiency. Which of these forms of efficiency is most difficult to test? Which is most likely to be refuted? Explain how to test weak-form efficiency in the stock market.

ANSWER: The weak form suggests that security prices reflect recent price movements and trading information. The semistrong form suggests that security prices reflect all publicly traded information. The strong form suggests that security prices reflect public and private information.

Weak-form efficiency can be tested by searching for a nonrandom pattern in stock prices. If future price movements can be predicted by assessing the past movements, a market inefficiency is detected.

- 17. Market Efficiency.** A consulting firm was hired to determine whether a particular trading strategy could generate abnormal returns. The strategy involved taking positions based on recent historical movements in stock prices. The strategy did not achieve abnormal returns. Consequently, the consulting firm concluded that the stock market is weak-form efficient. Do you agree? Explain.

ANSWER: Students have their own opinions, but a test of one strategy does not allow for a definite conclusion that weak-form efficiency exists. Some other strategy may still achieve abnormal returns.

Advanced Questions

- 18. Value at Risk.** Describe the value-at-risk method for measuring risk.

ANSWER: Value at risk is a risk measurement that estimates the largest expected loss to a particular investment position for a specified confidence level. It is intended to warn investors about the potential maximum loss that could occur. If the investors are uncomfortable with the potential loss that could occur in a day or a week, they can revise their investment portfolio to make it less risky.

The value at risk is also commonly used to measure the risk of a portfolio. Some stocks may be perceived to have high risk when assessed individually, but low risk when assessed as part of a portfolio. This is because the likelihood of a large loss in the portfolio is influenced by the probabilities of simultaneous losses in all of the component stocks for the period of concern.

19. Implied Volatility. Explain the meaning and use of implied volatility.

ANSWER: Investors can derive the stock's implied standard deviation (ISD) from the stock option pricing model. The premium on a call option for a stock is dependent on factors such as the relationship between the current stock price and the exercise (strike) price of the option, the number of days until the expiration date of the option, and the anticipated volatility of the stock price movements. There is a formula for estimating the call option premium based on various factors. The actual values of these factors are known, except for the anticipated volatility. However, by plugging in the actual option premium paid by investors for that specific stock, it is possible to derive the anticipated volatility level. Market participants who wish to forecast volatility over a 30-day period will consider a call option on the stock that has 30 days to expiration. This measurement represents the anticipated volatility of the stock over a 30-day period by investors who are trading stocks. Participants may use this measurement as their own forecast of that specific stock's volatility.

Problems

1. Risk-Adjusted Return Measurements. Assume the following information over a five-year period.

- ◆ Average risk-free rate = 6%
- ◆ Average return for Crane stock = 11%
- ◆ Average return for Load stock = 14%
- ◆ Standard deviation of Crane stock returns = 2%
- ◆ Standard deviation of Load stock returns = 4%
- ◆ Beta of Crane stock = 0.8
- ◆ Beta of Load stock = 1.1

Determine which stock has higher risk-adjusted returns when using the Sharpe Index. Which stock has higher risk-adjusted returns when using the Treynor Index? Show your work.

ANSWER:

Sharpe Index of Crane stock:

$$\begin{aligned}\text{Sharpe index} &= \frac{\bar{R} - \bar{R}_f}{\sigma} \\ &= \frac{11\% - 6\%}{2\%} \\ &= 2.5\end{aligned}$$

Sharpe Index of Load stock:

$$\text{Sharpe index} = \frac{\bar{R} - \bar{R}_f}{\sigma}$$

$$= \frac{11\% - 6\%}{0.8}$$

$$= .0625$$

Treynor Index of Crane stock:

$$\text{Treynor index} = \frac{\bar{R} - \bar{R}_f}{B}$$

$$= \frac{11\% - 6\%}{0.8}$$

$$= .0625$$

Treynor Index of Load stock:

$$\text{Treynor index} = \frac{\bar{R} - \bar{R}_f}{B}$$

$$= \frac{14\% - 6\%}{1.1}$$

$$= .0727$$

Crane stock has a higher Sharpe Index while Load stock has a higher Treynor Index.

2. **Measuring Expected Return.** Assume Mess stock has a beta of 1.2. If the risk-free rate is 7 percent, and the market return is 10 percent, what is the expected return on Mess stock?

ANSWER:

$$\text{Expected return} = 7\% + 1.2(10\% - 7\%)$$

$$= 10.6\%$$

3. **Using the PE Method.** You found that IBM is expected to generate earnings of \$4.38 per share this year, and that the mean PE ratio for its industry is 27.195. Using the PE valuation method, what should be the value of IBM shares?

ANSWER:

$$\text{Value} = (\text{Expected earnings of IBM per share}) \times (\text{Mean industry P/E ratio})$$

$$\text{Value} = \$4.38 \times 27.195$$

$$\text{Value} = \$119.114$$

4. **Using the Dividend Discount Model.** Suppose that you are interested in buying the stock of a company that has a policy of paying a \$6 per share dividend every year. Assuming no changes in the firm's policies, what is the value of a share of stock if the required rate of return is 11 percent?

ANSWER:

$$\begin{aligned}PV_{\text{of stock}} &= D/k \\ &= 6/0.11 \\ &= \$54.5 \text{ per share}\end{aligned}$$

5. **Using the Dividend Discount Model.** Micro, Inc. will pay a dividend of \$2.30 per share next year. If the company plans to increase its dividend by 9 percent per year indefinitely, and you require a 12 percent return on your investment, what should you pay for the company's stock?

ANSWER:

$$\begin{aligned}PV_{\text{of stock}} &= D_1/(k - g) \\ PV_{\text{of stock}} &= 2.3/(0.12 - 0.09) \\ &= \$76.67 \text{ per share}\end{aligned}$$

6. **Using the Dividend Discount Model.** Suppose you know that a company just paid a dividend of \$1.75 per share on its stock and that the dividend will continue to grow at a rate of 8 percent per year. If the required return on this stock is 10 percent, what is the current share price?

ANSWER:

$$\begin{aligned}D_1 &= D_0(1 + g) \\ D_1 &= 1.75(1 + 0.08) = 1.89 \\ PV \text{ of stock} &= D_1/(k - g) \\ PV \text{ of stock} &= 1.89/(0.10 - 0.08) \\ &= \$94.5 \text{ per share}\end{aligned}$$

7. **Deriving the Required Rate of Return.** The next expected dividend for Sun, Inc., will be \$1.20 per share and analysts expect the dividend to grow at a rate of 7 percent indefinitely. If Sun stock currently sells for \$22 per share, what is the required rate of return?

ANSWER:

$$\begin{aligned}PV \text{ of stock} &= D_1/(k - g) \\ k &= (D_1/PV \text{ of stock}) + g \\ k &= (1.20/22) + 0.07 = 0.1245 = 12.45\%\end{aligned}$$

8. **Deriving the Required Rate of Return.** A share of common stock currently sells for \$110. Current dividends are \$8 per share, and are expected to grow at 6 percent per year indefinitely. What is the rate of return required by investors in the stock?

ANSWER:

$$\begin{aligned}D_1 &= D_0(1 + g) \\ D_1 &= \$8.00(1 + 0.06) = \$8.48 \\ k &= (D_1/PV \text{ of stock}) + g \\ k &= (8.48/110) + 0.06 = 0.137 = 13.7\%\end{aligned}$$

9. **Deriving the Required Rate of Return.** A stock has a beta of 2.2, the risk-free rate is 6 percent, and the expected return on the market is 12 percent. Using the CAPM, what would you expect the

required rate of return on this stock to be? What is the market risk premium?

ANSWER:

$$\begin{aligned}R_j &= R_f + B_j(R_m - R_f) \\R_j &= 6\% + 2.2(12\% - 6\%) \\R_j &= 19.2\%\end{aligned}$$

The market risk premium is 6 percent.

- 10. Deriving the Stock's Beta.** You are considering investing in a stock that has an expected return of 13 percent. If the risk-free rate is 5 percent and the market risk premium is 7 percent, what must the beta of this stock be?

ANSWER:

$$\begin{aligned}R_j &= R_f + B_j(R_m - R_f) \\0.13 &= 0.05 + B_j(0.07) \\B_j &= 1.142\end{aligned}$$

- 11. Measuring Stock Returns.** Suppose you bought a stock at the beginning of the year for \$76.50. During the year, the stock paid a dividend of \$0.70 per share and had an ending share price of \$99.25. What is the total percentage return from investing in that stock over the year?

ANSWER:

$$\begin{aligned}R &= \frac{(SP - INV) + D}{INV} \\&= \frac{(99.25 - 76.5) + 0.70}{76.5} \\&= 30.6\%\end{aligned}$$

- 12. Measuring the Portfolio Beta.** Assume the following information:

Beta of IBM = 1.31

Beta of LUV = 0.85

Beta of ODP = 0.94

If you invest 40 percent of your money in IBM, 30 percent in LUV and 30 percent in ODP, what is your portfolio's beta?

ANSWER:

$$\begin{aligned}\text{Portfolio beta} &= 0.4(1.31) + 0.3(0.85) + 0.3(0.94) \\&= 0.524 + 0.255 + 0.282 = 1.061\end{aligned}$$

13. Measuring the Portfolio Beta. Using the information from Problem 12, suppose that you instead decide to invest \$20,000 in IBM, \$30,000 in LUV and \$50,000 in ODP. What is the beta of your portfolio now?

ANSWER:

$$\begin{aligned}\text{Portfolio beta} &= [(20 \times 1.31) + (30 \times 0.85) + (50 \times 0.94)]/100 \\ &= (26.2 + 25.5 + 47)/100 \\ &= 0.987\end{aligned}$$

16. Dividend Model Relationships.

a. When computing the price of the stock with a dividend discount model, determine how the price of a stock would be affected if the required rate of return is increased. Explain the logic of this relationship.

ANSWER: The price of the stock is reduced, because the cash flows would be discounted at a higher rate.

b. When computing the price of a stock using the constant-growth dividend discount model, determine how the price of a stock would be affected if the growth rate is reduced. Explain the logic of this relationship.

ANSWER: The price of the stock is reduced, because the expected future cash flows in distant periods are reduced if the growth rate is revised downward.

17. CAPM Relationships.

a. When using the CAPM, determine how the required rate of return on a stock would be affected if the risk-free rate is lower.

ANSWER: The required rate of return would be lower, because it should reflect a premium above the risk-free rate (which is now lower).

b. When using the CAPM, determine how the required rate of return on a stock would be affected if the market return is lower.

ANSWER: The required rate of return would be lower, because the premium that is added to the risk-free rate would now be lower.

c. When using the CAPM, determine how the required rate of return on a stock would be affected if the beta is higher.

ANSWER: The required rate of return would be higher, because a given premium above the risk-free rate would now be higher.

18. Value at Risk.

a. How is the maximum expected loss of a stock affected by an increase in the volatility (standard deviation), based on a 95 percent confidence interval?

ANSWER: The maximum expected loss would now be more pronounced (worse) than before, because the larger standard deviation creates a greater deviation from (below) the expected outcome.

- b. Determine how the maximum expected loss of a stock would be affected by an increase in the expected return of the stock, based on a 95 percent confidence interval.

ANSWER: The maximum expected loss would now be less pronounced than before, because the expected outcome is higher and the deviation from that will result in a maximum loss that is not as bad.

Chapter 12

Market Microstructure and Strategies

Outline

Stock Market Transactions

- Placing an Order
- Margin Trading
- Short Selling

How Trades Are Executed

- Floor Brokers
- Specialists
- Effect of the Spread on Transaction Costs
- Electronic Communication Networks (ECNs)
- Program Trading

Regulation of Stock Trading

- Circuit Breakers
- Trading Halts
- Securities and Exchange Commission (SEC)

How Barriers to International Stock Trading Have Decreased

- Reduction in Transaction Costs
- Reduction in Information Costs
- Reduction in Exchange Rate Risk

Key Concepts

1. Explain how transactions are executed, from the point of the order until the trade is made.
2. Explain the development of electronic communication networks (ECNs), and how they can improve the structure for executing transactions.
3. Explain how regulation is needed to ensure orderly and fair trading.

Questions

1. **Orders.** Explain the difference between a market order and a limit order.

ANSWER: A market order is an order to execute a transaction at the prevailing market price. A limit order is an order to execute a transaction only if the price reaches a specified level.

2. **Margins.** Explain how margin requirements can affect the potential return and risk from investing in a stock. What is the maintenance margin?

ANSWER: Margin requirements specify a proportion of funds to be invested that are borrowed versus paid in cash. Borrowing increases the return earned from the investment in a particular stock. However, it also increases the risk, because it magnifies the potential loss (negative return) that could occur as a result of investing in a stock.

The maintenance margin is the minimum amount of the margin that must be maintained over the time the investor holds the investment.

3. **Short Selling.** Under what conditions might investors consider short selling a specific stock? Describe the short selling process. Explain the short interest ratio.

ANSWER: Investors consider short selling when they expect that a stock's price to decrease. Investors submit the order to their broker who borrows the stock on behalf of the investors and sells the stock. The investors will ultimately need to purchase the stock that they borrowed. Their gain is the difference between the price at which they sold the stock versus the price at which they purchased it. If the stock price declined over time, they should have been able to purchase the stock for a lower price at which they sold it.

The short interest ratio is equal to the number of shares that were sold short divided by the average number of shares traded per day. A large short interest ratio implies a large amount of short selling relative to the volume of trading for the stock.

4. **Stock Trading.** Describe the role of a floor broker and a specialist. Explain how specialists or market-makers may attempt to capitalize on stock price discrepancies.

ANSWER: A floor broker executes orders on an exchange. A specialist can also execute orders for clients or engage in trades for his or her own account.

Specialists and market-makers commonly take positions to capitalize on the discrepancy between the prevailing stock price and their own valuation of the stock. When many uninformed investors take buy or sell positions that push a stock's price away from its fundamental value, the stock price is distorted as a result of the "noise" caused by the uninformed investors (called "noise traders"). Specialists and market-makers may take the opposite position of the uninformed investors, and therefore stand to benefit if their expectations are correct.

5. **ECNs.** What are electronic communication networks (ECNs)?

ANSWER: Electronic communication networks (ECNs) are automated systems for disclosing and sometimes executing stock trades. They were created in the mid-1990s to publicly display buy and sell orders of stock. They were adapted to facilitate the execution of orders, and normally service institutional rather than individual investors. In 1997, the Securities and Exchange Commission

(SEC) allowed ECNs complete access to the orders placed in the NASDAQ market. The SEC required that any quote provided by a market-maker must be made available to all market participants. This eliminated more favorable quotes that were exclusive to proprietary clients. It also resulted in significantly lower spreads between the bid and ask prices quoted on NASDAQ.

- 6. Program Trading.** What is program trading? Briefly describe the conclusions reached by Furbush and by Roll from their studies of the relationship between the intensity of program trading and the magnitude of the declines in stock prices during the stock market crash of 1987.

ANSWER: The NYSE defines as the simultaneous buying and selling of a portfolio of at least 15 different stocks that are contained within the S&P 500 index valued at more than \$1 million. This is a narrow definition, as the term is sometimes used in other contexts. The most common program traders are large securities firms. They conduct the trades for their own accounts or for other institutional investors such as pension funds, mutual funds, and insurance companies. The term program refers to the use of computers in what is known as the Designated Order Turnaround (DOT) system at the NYSE, which allows traders to send orders to many trading posts at the exchange.

- 7. Circuit Breakers.** Explain how circuit breakers are used to reduce the likelihood of a large stock market crash.

ANSWER: Stock exchanges can impose circuit breakers, which are restrictions on trading when stock prices or a stock index reaches a specified threshold level. The NYSE has experimented with different types of circuit breakers since the stock market crash of October 1987. The prevailing circuit breakers have three threshold levels for a daily change in the Dow Jones Industrial Average (DJIA) from its previous closing price: Level 1 (10 percent), Level 2 (20 percent), and Level 3 (30 percent). If the Level 1 threshold is reached, there is brief (30- or 60-minute) halt in trading. If the Level 2 threshold is reached, there is slightly longer (1- to 2-hour) halt in trading. If the Level 3 threshold is reached, the market will be closed for the day. The NASDAQ market and other regional exchanges impose similar circuit breakers.

- 8. SEC.** Briefly describe the structure and role of the Securities and Exchange Commission (SEC).

ANSWER: The SEC is composed of five commissioners appointed by the president of the United States and confirmed by the Senate. Each commission serves a five-year term. The terms are staggered, so that one commissioner's term is added each year and replaced by a new appointee. The president also assigns one of the five commissioners the role of Chairman.

The commissioners meet to assess whether the existing regulations are successfully preventing abuses, and to revise the existing regulations. Specific staff members of the SEC may be assigned the role of developing a proposal for a new regulation to prevent a particular abuse that is occurring. New regulations can be adopted within the commission, and then distributed to the public for feedback before final approval. Some of the more critical proposals are subject to Congressional review before final approval.

- 9. Bid-Ask Spread.** Explain the bid-ask spread situation in the NASDAQ market in 1991. How was it changed as a result of the SEC?

ANSWER: The typical structure by market makers in the Nasdaq market was a bid and ask price in even-eighths, such as a bid price of \$32 $\frac{2}{8}$ and an ask price of \$32 $\frac{4}{8}$. In this way, the spread on each transaction was always at least \$0.25. This structure was peculiar, especially considering that the odd-eighths were sometimes used earlier in the year, allowing a spread on those same stocks of $\frac{1}{8}$.

Within a few months, the spread had doubled. This caused suspicion that the market makers had implicitly colluded, by agreeing to set wider spreads.

In 1996, the SEC charged that the National Association of Securities (NASD), which regulates the NASDAQ, had failed to prevent some activities by NASDAQ market-makers that reduced competition. In August 1996, the NASD settled the case by offering to spend \$100 million to improve its monitoring of NASDAQ market-makers.

Problems

- 1. Buying on Margin.** Assume that Vogl stock is priced at \$50 per share and pays a dividend of \$1 per share. An investor purchases the stock on margin, paying \$30 per share and borrowing the remainder from the brokerage firm at 10 percent annualized interest. If after one year, the stock is sold at a price of \$60 per share, what is the return to the investors?

ANSWER:

$$\begin{aligned}
 R &= \frac{SP - INV - LOAN + D}{INV} \\
 &= \frac{\$60 - \$30 - \$22 + \$1}{\$30} \\
 &= 30\%
 \end{aligned}$$

- 2. Buying on Margin.** Assume that Duever stock is priced at \$80 per share and pays a dividend of \$2 per share. An investor purchases the stock on margin, paying \$50 per share and borrowing the remainder from the brokerage firm at 12 percent annualized interest. If after one year, the stock is sold at a price of \$90 per share, what is the return to the investor?

ANSWER:

$$\begin{aligned}
 R &= \frac{SP - INV - LOAN + D}{INV} \\
 &= \frac{\$90 - \$50 - \$33.60 + \$2}{\$50} \\
 &= 16.8\%
 \end{aligned}$$

- 3. Buying on Margin.** Suppose that you buy a stock for \$48 by paying \$25 and borrowing the remaining \$23 from a brokerage firm at 8 percent annualized interest. The stock pays an annual dividend of \$0.80 per share, and after one year, you are able to sell it for \$65. Calculate your return on the stock. Then, calculate the return on the stock if you had used only personal funds to make the purchase. Repeat the problem, assuming that only personal funds are used, and that at the end of one year you sell the stock for \$40.

ANSWER:

$$\begin{aligned} R &= \frac{SP - INV - LOAN + D}{INV} \\ &= \frac{\$65 - \$25 - \$24.84 + \$.80}{\$25} \\ &= 63.84\% \end{aligned}$$

If only personal funds are used:

$$\begin{aligned} R &= \frac{SP - INV - LOAN + D}{INV} \\ &= \frac{\$65 - \$48 - \$0 + \$.80}{\$48} \\ &= 37.08\% \end{aligned}$$

If only personal funds are used, and you sell stock for \$40:

$$\begin{aligned} R &= \frac{SP - INV - LOAN + D}{INV} \\ &= \frac{\$40 - \$48 - \$0 + \$.80}{\$48} \\ &= -15\% \end{aligned}$$

4. **Buying on Margin.** How would the return on a stock be affected by a lower initial investment (and higher loan amount)? Explain the relationship between the proportion of funds borrowed and the return.

ANSWER: The return is increased when there is a lower initial investment, as the gain on the investment would be higher. The gain as a percentage of the investment is higher when the size of the investment is smaller. However, a negative return is also more pronounced when there is a lower investment (a higher level of borrowing), which represents the tradeoff when buying stock on margin.

Chapter 13

Financial Futures Markets

Outline

Background on Financial Futures

- Purpose of Trading Financial Futures
- Structure of the Futures Market
- Trading Futures

Interpreting Financial Futures Tables

Valuation of Financial Futures

- Impact of the Opportunity Cost

Explaining Price Movements of Bond Futures Contracts

Speculating with Interest Rate Futures

- Impact of Leverage

Closing Out the Futures Position

Hedging with Interest Rate Futures

- Using Interest Rate Futures to Create a Short Hedge
- Using Interest Rate Futures to Create a Long Hedge
- Hedging Net Exposure

Bond Index Futures

Stock Index Futures

- Valuing Stock Index Futures Contracts
- Speculating with Stock Index Futures
- Hedging with Stock Index Futures
- Dynamic Asset Allocation with Stock Index Futures
- Prices of Stock Index Futures versus Stocks
- Arbitrage with Stock Index Futures
- Circuit Breakers on Stock Index Futures

Single Stock Futures

Risk of Trading Futures Contracts

- Market Risk
- Basis Risk
- Liquidity Risk
- Credit Risk

Prepayment Risk
Operational Risk

Regulation in the Futures Markets

Institutional Use of Futures Markets

Globalization of Futures Markets

Non-U.S. Participation in U.S. Futures Contracts
Foreign Stock Index Futures
Currency Futures Contracts

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.

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 a larger amount of 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 a larger amount of 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 even 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. Index Arbitrage.** Explain how index arbitrage may be used.

ANSWER: If the stock index futures price is different from the prices of stocks making up the index, index arbitrage could be executed. If the index is priced higher, securities firms could purchase the stocks and simultaneously sell stock index futures.

- 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.

Problems

- 1. 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.

Chapter 14

Options Markets

Outline

Background on Options

- Markets Used to Trade Options
- How Option Trades Are Executed
- Types of Orders
- Stock Option Quotations

Speculating with Stock Options

- Speculating with Call Options
- Speculating with Put Options
- Excessive Risk from Speculation

Determinants of Stock Option Premiums

- Determinants of Call Option Premiums
- Determinants of Put Option Premiums

Explaining Changes in Option Premiums

- Indicators Monitored by Participants in the Options Market

Hedging with Stock Options

- Hedging with Call Options
- Hedging with Put Options

Using Options to Measure a Stock's Risk

Options on ETFs and Stock Indexes

- Hedging with Stock Index Options
- Dynamic Asset Allocation with Stock Index Options
- Using Index Options to Measure the Market's Risk

Options on Futures Contracts

- Speculating with Options on Futures

Hedging with Options on Futures

- Hedging with Options on Interest Rate Futures
- Hedging with Options on Stock Index Futures

Institutional Use of Options Markets

- Options as Compensation

Globalization of Options Markets

Currency Options Contracts

Key Concepts

1. Explain why speculators take positions in stock options and how the outcome is determined.
2. Explain why institutional investors take positions in stock options and the tradeoff involved.
3. Explain how stock index options are used by institutional investors.
4. Explain how options on financial futures are used by institutional investors.

Questions

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

ANSWER: A call option requires a premium above and beyond the price to be paid for the financial instrument, whereas a financial futures contract does not contain such a premium. In addition, the call option represents a right but not an obligation, whereas a futures contract represents an obligation.

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

ANSWER: Call options are purchased by speculators when the price of the underlying stock is expected to increase in the near future. If the stock price declines, the strategy of purchasing a call option can backfire.

Call options are sold by speculators when the price of the underlying stock is expected to decrease in the near future. If the stock price increases, the strategy of selling a call option would backfire. The maximum loss to a purchaser of a call option is the premium paid for the call option.

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

ANSWER: Put options are purchased by speculators when the price of the underlying stock is expected to remain stable or decrease in the near future. If the stock price increases, the strategy of purchasing a put option would backfire.

Put options are sold by speculators when the price of the underlying stock is expected to remain stable or increase in the near future. If the stock price decreases, the strategy of selling a put option can backfire. The maximum loss to a purchaser of a put option is the premium paid for the put option.

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

ANSWER: Speculators sell call options if they expect the price of the underlying stock to remain

stable or decline in the near future.

The risk to speculators that sell put options is that the price of the underlying stock declines.

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.

ANSWER: The greater the volatility of the underlying stock's price, the higher the premium. The higher the stock's existing price relative to the exercise price, the higher the premium. The longer the term to the expiration, the higher 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.

ANSWER: The greater the volatility of the underlying stock's price, the higher the premium. The lower the stock's existing price relative to the exercise price, the higher the premium. The longer the term to the expiration date, the higher 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?

ANSWER: They could purchase stock options on various stocks to lock in the maximum price they will have to pay for those stocks. Once they have sufficient funds to purchase stocks, they can exercise their options (if it is feasible to do so).

8. **Hedging with Put Options.** Why would a financial institution holding ABC stock consider buying a put option on this stock rather than simply selling the stock?

ANSWER: If a financial institution is concerned about a possible temporary decline in ABC stock, but has favorable long-term expectations for the stock, it may purchase put options on ABC stock rather than sell its ABC stock.

Problems

1. **Writing Call Options.** A call option on Illinois stock specifies an exercise price of \$38. Today's price of the stock 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:

<u>Assumed Stock Price at the Time the Call Option Is About to Expire</u>	<u>Net Profit or Loss per Share to Be Earned by the Writer (Seller) of the Call Option</u>
\$37	
\$39	
\$41	
\$43	
\$45	
\$48	

ANSWER:

<u>Assumed Stock Price at the Time the Call Option Is About to Expire</u>	<u>Net Profit or Loss per Share to Be Earned by the Writer (Seller) of the Call Option</u>
\$37	\$5
\$39	\$4
\$41	\$2
\$43	\$0
\$45	-\$2
\$48	-\$5

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:

<u>Assumed Stock Price at the Time the Call Option Is About to Expire</u>	<u>Net Profit or Loss per Share to Be Earned by the Speculator</u>
\$50	
\$52	
\$54	
\$56	
\$58	
\$60	
\$62	

ANSWER:

<u>Assumed Stock Price at the Time the Call Option Is About to Expire</u>	<u>Net Profit or Loss per Share to Be Earned by the Speculator</u>
\$50	-\$3
\$52	-\$3
\$54	-\$3
\$56	-\$2
\$58	\$0
\$60	\$2
\$62	\$4

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):

<u>Assumed Stock Price at the Time the Put Option Is About to Expire</u>	<u>Net Profit or Loss per Share to Be Earned by the Speculator</u>
\$60	
\$64	
\$68	

\$70
 \$72
 \$74
 \$76

ANSWER:

<u>Assumed Stock Price at the Time the Put Option Is About to Expire</u>	<u>Net Profit or Loss per Share to Be Earned by the Speculator</u>
\$60	\$3
\$64	-\$1
\$68	-\$5
\$70	-\$7
\$72	-\$8
\$74	-\$8
\$76	-\$8

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:

<u>Assumed Stock Price at the Time the Put Option Is About to Expire</u>	<u>Net Profit or Loss per Share to Be Earned by the Writer (Seller) of the Put Option</u>
\$20	
\$21	
\$22	
\$23	
\$24	
\$25	
\$26	

ANSWER:

<u>Assumed Stock Price at the Time the Put Option Is About to Expire</u>	<u>Net Profit or Loss per Share to Be Earned by the Writer (Seller) of the Put Option</u>
\$20	\$0
\$21	\$1
\$22	\$2
\$23	\$3
\$24	\$3
\$25	\$3
\$26	\$3

Chapter 16

Foreign Exchange Derivative Markets

Outline

Background on Foreign Exchange Markets

- Institutional Use of Foreign Exchange Markets
- Exchange Rate Quotations
- Types of Exchange Rate Systems

Factors Affecting Exchange Rates

- Differential Inflation Rates
- Differential Interest Rates
- Central Bank Intervention
- Foreign Exchange Controls

Movements in Exchange Rates

Forecasting Exchange Rates

- Technical Forecasting
- Fundamental Forecasting
- Market-Based Forecasting
- Mixed Forecasting

Forecasting Exchange Rate Volatility

Speculation in Foreign Exchange Markets

Foreign Exchange Derivatives

- Forward Contracts
- Currency Futures Contracts
- Currency Swaps
- Currency Options Contracts
- Use of Foreign Exchange Derivatives for Speculating

International Arbitrage

- Locational Arbitrage
- Triangular Arbitrage
- Covered Interest Arbitrage

Explaining Price Movements of Foreign Exchange Derivatives

- Indicators of Foreign Exchange Derivative Prices

Key Concepts

1. Identify factors that influence exchange rates.
2. Explain how various foreign exchange derivatives can be used to hedge against exchange rate movements.
3. Explain how arbitrage can assure that currency values are not mispriced.

Questions

1. **Exchange Rate Systems.** Explain the exchange rate system that existed during the 1950s and 1960s. How did the Smithsonian Agreement in 1971 revise it? How does today's exchange rate system differ?

ANSWER: The 1950s and 1960s were part of the Bretton Woods era, in which currency values were maintained within 1 percent of a specified rate. In 1971, the Smithsonian Agreement called for a widening of the boundaries to 2-1/4 percent around each currency's specified rate. These boundaries were eliminated in 1973. Today, there are no explicit boundaries.

2. **Dirty Float.** Explain the difference between a freely floating system and a dirty float. Which type is more representative of the United States?

ANSWER: A free float implies that currencies are market determined without government intervention. A dirty float implies that currency values can fluctuate but are subject to government intervention. The dirty float is more representative of the United States.

3. **Impact of Quotas.** Assume that European countries impose a quota on goods imported from the United States, and the United States does not plan to retaliate. How could this affect the value of the euro? Explain.

ANSWER: A quota on goods imported from the United States by Europe will reduce the supply of euros for sale (to be exchanged for dollars) and places upward pressure on the euro.

4. **Impact of Capital Flows.** Assume that stocks in the United Kingdom become very attractive to U.S. investors. How could this affect the value of the British pound? Explain.

ANSWER: U.S. investors would convert dollars to pounds to purchase British stocks. Thus, the value of the pound may appreciate against the dollar in response to the increased U.S. demand for pounds.

5. **Impact of Inflation.** Assume that Mexico suddenly experiences high and unexpected inflation. How could this affect the value of the Mexican peso according to purchasing power parity (PPP) theory?

ANSWER: High Mexican inflation would cause an increased Mexican demand for U.S. goods (increased supply of pesos for sale) and a reduced U.S. demand for Mexican goods (and therefore a reduced demand for Mexican pesos). Both forces place downward pressure on the value of the peso.

- 6. Impact of Economic Conditions.** Assume that Switzerland has a very strong economy, placing upward pressure on both inflation and interest rates. Explain how these conditions could place pressure on the value of the Swiss franc, and determine whether the franc's value will rise or fall.

ANSWER: A stronger economy will cause an increased Swiss demand for U.S. goods, which places downward pressure on the value of the franc. A higher Swiss inflation rate will also increase the Swiss demand for U.S. goods, which places downward pressure on the franc's value.

Higher Swiss interest rates may attract U.S. funds and place upward pressure on the franc's value. The first two factors relate to international trade while the third factor relates to capital flows. If trade flows are larger, the franc's value is expected to depreciate.

- 7. Central Bank Intervention.** The Bank of Japan desires to decrease the value of the Japanese yen against the dollar. How could it use direct intervention to do this?

ANSWER: The Bank of Japan could flood the foreign exchange market with yen by selling yen in exchange for U.S. dollars, causing downward pressure on the yen's value.

- 8. Bank Speculation.** When would a commercial bank take a short position in a foreign currency? A long position?

ANSWER: A commercial bank tends to take a short position in a foreign currency if it expects the currency to depreciate. It may take a long position in a currency if it expects the currency to appreciate.

- 9. Risk from Speculating.** Seattle Bank was long in Australian dollars and short in Canadian dollars. Explain a possible future scenario that could adversely affect the bank's performance.

ANSWER: If the Canadian dollar appreciates against the U.S. dollar, while the Australian dollar depreciates against the U.S. dollar, this implies that the Canadian dollar is appreciating against the Australian dollar. Seattle Bank would be adversely affected by this scenario. If the Australian dollar inflows from closing out the long position are used to cover the short position in Canadian dollars, they will be worth fewer Canadian dollars (because of the Australian dollar's assumed depreciation).

- 10. Impact of a Weak Dollar.** How does a weak dollar affect U.S. inflation? Explain.

ANSWER: A weak dollar tends to cause higher prices paid by U.S. firms for foreign supplies and materials. It also reduces foreign competition and allows U.S. producers to raise prices more easily without concern about losing business. Both forces reflect upward pressure on U.S. inflation.

- 11. Speculating With Foreign Exchange Derivatives.** Explain how foreign exchange derivatives could be used by U.S. speculators to speculate on the expected appreciation of the Japanese yen.

ANSWER: U.S. speculators could attempt to lock in an exchange rate at which they could exchange dollars for yen at a future point in time. This could be accomplished by purchasing forward contracts or futures contracts on Japanese yen, negotiating a swap for yen, or purchasing yen call options. They could also sell yen put options to capitalize on their expectations.