

CHAPTER 24
Warrants and Convertibles

Multiple Choice Questions:

I. DEFINITIONS

WARRANT

- b 1. A warrant gives the owner:
- a. the obligation to sell securities directly to the firm at a fixed price for a specified time.
 - b. the right to purchase securities directly from the firm at a fixed price for a specified time.
 - c. the obligation to purchase securities directly from the firm at a fixed price for a specified time.
 - d. the right to sell securities directly to the firm at a fixed price for a specified time.
 - e. None of the above.

Difficulty level: Easy

WARRANT

- d 2. Warrants are most often issued in combination with:
- a. new publicly placed common stock.
 - b. new privately placed common stock.
 - c. new publicly placed debt.
 - d. new privately placed debt.
 - e. preferred stock.

Difficulty level: Easy

WARRANT

- c 3. An "equity kicker" most often refers to a:
- a. bond with conversion privileges.
 - b. preferred stock offering with conversion privileges.
 - c. warrant.
 - d. lettered common stock.
 - e. None of the above.

Difficulty level: Easy

WARRANT

- c 4. Warrants are similar to traded options except:
- a. only warrants have exercise prices.
 - b. only warrants depend on changes in the underlying stock to determine value.
 - c. warrants affect the number of shares outstanding.
 - d. Both A and C.
 - e. Both A and B.

Difficulty level: Medium

VALUE OF WARRANTS

- e 5. BrightView Windows issued warrants with an exercise price of \$17. BrightView's common stock currently sells for \$20 per share. The warrants are:
- in the money.
 - out of the money.
 - valuable.
 - not very valuable.
 - Both A and C.

Difficulty level: Medium

II. CONCEPTS

VALUE OF WARRANT

- d 6. Warrants are similar to options, in that the value of the warrant is limited by:
- expiring worthless if the stock price is below the total warrant exercise price.
 - the trading capabilities of the exchange used.
 - the price of the underlying stock divided by the number of warrants needed to purchase a share.
 - Both A and C.
 - Both B and C.

Difficulty level: Medium

WARRANTS AND CALL OPTIONS

- b 7. Which of the following would not describe the difference between warrants and call options?
- Warrants are issued by firms whereas call options are issued by individuals.
 - Call options have an exercise price whereas warrants do not.
 - Exercising of warrants creates dilution whereas exercising all options does not.
 - When call options are exercised existing shares trade hands whereas if warrants are exercised new stock must be issued.
 - None of the above.

Difficulty level: Easy

WARRANTS AND CALL OPTIONS

- e 8. Two major differences between a warrant and a call option are:
- warrants are contracts outside of the firm while options are within the firm.
 - warrants have long maturities while options are usually short maturities.
 - warrant exercise dilutes the value of equity while option exercise does not.
 - Both A and C.
 - Both B and C.

Difficulty level: Medium

WARRANTS AND CALL OPTIONS

- d 9. Concerning warrants and call options, which of the following statements generally is correct?
- a. The issue procedures for both are quite similar.
 - b. When a call option is exercised, the firm must issue new stock.
 - c. When a warrant is exercised, existing stock changes hands.
 - d. Exercise of a call option does not affect share value, but warrant exercise does.
 - e. None of the above is correct.

Difficulty level: Medium

WARRANTS AND DIVIDENDS

- c 10. Which of the following would harm the position of a warrant holder?
- a. a 3 for 1 stock split
 - b. a large stock dividend of 20%
 - c. a large cash dividend
 - d. listing of the warrants on the NYSE
 - e. None of the above would harm the warrant holders.

Difficulty level: Challenge

WARRANTS AND CALL OPTIONS

- e 11. The gain from exercising a warrant is similar to the gain from exercising a call option except:
- a. the gain on a warrant is greater by the fraction of warrant shares divided by total shares.
 - b. the gain on a warrant is limited by the firm's value after being reduced by the debt of the firm.
 - c. the gain on a warrant is decreased by the fraction of original shares divided by total post exercise shares.
 - d. Both A and B.
 - e. Both B and C.

Difficulty level: Challenge

EXERCISE OF WARRANTS

- b 12. The exercise of warrants creates new shares which:
- a. increases the total number of shares but does not affect share value.
 - b. increases the total number of shares which can reduce an individual's share value.
 - c. does not change the number of shares outstanding similar to options.
 - d. increases share value because cash is paid into the firm at the time of warrant exercise.
 - e. None of the above.

Difficulty level: Easy

CONVERTIBLES

- b 13. If a corporate security can be exchanged for a fixed number of shares of stock, the security is said to be:
- a. callable.
 - b. convertible.
 - c. protected.
 - d. puttable.
 - e. None of the above.

Difficulty level: Easy

CONVERTIBLES

- c 14. A convertible preferred stock is similar to a convertible bond except:
- the conversion ratio is fixed (given).
 - the conversion price is fixed (given).
 - the time to maturity is infinite.
 - All of the above.
 - None of the above.

Difficulty level: Easy

CONVERSION PRICE

- a 15. The holder of a \$1,000 face value bond has the right to exchange the bond anytime before maturity for shares of stock priced at \$50 per share. The \$50 is called the:
- conversion price.
 - stated price.
 - exercise price.
 - striking price.
 - None of the above.

Difficulty level: Easy

CONVERTIBLE BONDS

- c 16. Concerning convertible bonds, which of the following statements is not correct?
- The value of a convertible bond will generally be greater than its straight bond value.
 - The value of a convertible bond will generally be greater than its conversion value.
 - The difference between the conversion value and the straight bond value is the conversion or option premium.
 - The coupon rate on a nonconvertible bond will generally exceed the coupon rate on an otherwise identical convertible bond.
 - All of the above are correct.

Difficulty level: Medium

CONVERTIBLE BONDS

- d 17. Concerning convertible bonds, which of the following statements is not correct?
- A convertible bond issue would generally have fewer restrictive covenants than an otherwise identical nonconvertible bond.
 - Convertible bonds can be issued at a lower coupon compared with otherwise non-convertible bonds.
 - If the value of a convertible bond exceeds the maximum of its straight bond value or its conversion value, the difference would be referred to as the option value.
 - Since convertible bonds will be exchanged for common stock, convertible bonds are generally not callable.
 - More than one of the above is incorrect.

Difficulty level: Medium

CONVERTIBLE BONDS

- a 18. Concerning convertible bonds, which of the following statements is not correct?
- With regard to security, most convertible bonds are secured by common stock (i.e., they are collateral trust bonds).
 - For most convertible bonds, the issuing firm can, under certain circumstances, effectively force bondholders to convert to common stock.
 - When a convertible bond is called, the owner has the option of receiving cash or stock for the bond.
 - All of the above are incorrect.
 - All of the above are correct.

Difficulty level: Medium

CONVERTIBLE BONDS

- d 19. A convertible bond has an option value which is equal to:
- the market value of the convertible bond minus the straight bond value.
 - The market value of the convertible bond minus the conversion value.
 - the market value of the convertible bond minus the conversion premium.
 - the market value of the convertible bond minus the maximum of the straight bond value or conversion value.
 - None of the above.

Difficulty level: Medium

STRAIGHT BONDS AND SHARE VALUE

- d 20. A firm has experienced a significant increase in share value. In retrospect, which of the following securities would have been best to have issued prior to the change in share value?
- Common stock
 - Bond/warrant package
 - Convertible preferred stock
 - Straight bonds
 - Convertible bonds

Difficulty level: Medium

CONVERTIBLE BONDS AND SHARE VALUE

- a 21. A firm has experienced a significant decrease in share value. In retrospect, which of the following securities would have been best to have issued prior to the change in share value?
- Convertible bonds
 - Convertible preferred stock
 - Straight debt
 - Indifferent between A and B.
 - Indifferent between A, B, and C.

Difficulty level: Medium

CONVERTIBLES AND RISK

- a 22. Issuing convertible bonds or bonds with warrants is useful for a company of unknown risk because:
- a. the effects of risk are opposite on the two value components and tend to cancel each other out.
 - b. if the firm is high risk, the option premium will be higher while the straight bond value is fixed.
 - c. only risky companies issued these instruments.
 - d. the equity value is dependent on current risks only, not the future risk at conversion.
 - e. None of the above.

Difficulty level: Challenge

CONVERTIBLE DEBT

- b 23. Transfer or expropriation of wealth from bondholders to stockholders is less likely to occur when:
- a. subordinated straight debt is issued because there are other senior bondholders to protect them.
 - b. convertible debt is issued because the equity component will reduce these agency costs when value is shared.
 - c. convertible debt is issued because the holders can more readily sue when a high-risk project is under taken.
 - d. subordinated debt because monitoring is much easier with subordinated straight debt is issued.
 - e. None of the above.

Difficulty level: Challenge

TIMING ON CONVERSION

- e 24. From the shareholder's point of view, the optimum time to call a convertible bond is when the bond's conversion value is:
- a. less than the call price, but greater than the face value.
 - b. greater than the call price, but less than straight debt's value.
 - c. equal to the face value.
 - d. less than straight debt's value, but greater than the call price.
 - e. None of the above.

Difficulty level: Medium

EMPIRICAL RESEARCH – CALLING CONVERTIBLES

- c 25. Based on empirical studies, firms tend to call convertible bonds when the conversion value is:
- a. less than the conversion price.
 - b. greater than the straight bond value.
 - c. greater than the call price.
 - d. less than the face value.
 - e. None of the above.

Difficulty level: Medium

MARKET EFFICIENCY AND CONVERTIBLES

- b 26. Which of the following would not be a sensible explanation of why convertibles and warrants

are issued if markets are efficient?

- a. Cash flow from these securities best match cash flow of the firm.
- b. If the firm does well, convertible bonds will turn out to have been the better alternative versus issuing common stock.
- c. The securities are useful when it is costly to assess the risk of the issuing firm.
- d. The securities may resolve agency problems associated with raising money.
- e. All of the above are sensible explanations.

Difficulty level: Medium

III. PROBLEMS

UPPER AND LOWER LIMITS

- e 27. BrightView Windows issued warrants with an exercise price of \$17 for one share per warrant. On May 1, BrightView's common stock is at \$20 per share. The lower and upper limits on the warrant value on May 1 are:
 - a. \$ 0 and \$3
 - b. \$ 0 and \$17
 - c. \$ 3 and \$17
 - d. \$ 3 and \$20
 - e. \$ 17 and \$20

Difficulty level: Medium

The following information should be used for problems #28 – 32:
Diamond Drill Inc. has 150,000 shares and 15,000 warrants outstanding. A warrant holder can purchase a new share of stock for five warrants and \$5.00 per warrant. The stock is currently selling for \$27 per share.

CONVERSION RATIO

- a 28. The holder of a \$1,000 face value bond can exchange the bond any time for 25 shares of stock. The conversion ratio is:
 - a. 25.
 - b. 40.
 - c. 100.
 - d. Depends on the current market price of the bond.
 - e. None of the above.

Difficulty level: Easy

CONVERSION PRICE

- b 29. The holder of a \$1,000 face value bond can exchange the bond any time for 25 shares of stock.

The conversion price is:

- a. \$25.
- b. \$40.
- c. \$100.
- d. Depends on the current market price of the bond.
- e. None of the above.

Difficulty level: Easy

OWNERSHIP DILUTION

- b 30. If all warrants are exercised, what will your fraction of ownership be if you owned 20,000 shares originally?
 - a. 12.12%
 - b. 13.07%
 - c. 13.33%
 - d. 14.04%
 - e. Without knowing the exercise price the percent can not be determined.

Difficulty level: Medium

STOCK VALUE WITH WARRANTS

- c 31. If the warrants are all exercised immediately, what would be the market price of the stock?
 - a. \$22.78
 - b. \$25.13
 - c. \$26.96
 - d. \$28.00
 - e. \$29.00

Difficulty level: Challenge

GAIN FROM EXERCISE OF WARRANTS

- d 32. What would your gain be from exercising the warrants, assuming all are exercised?
 - a. \$ 0.00 per share
 - b. \$ 1.96 per share
 - c. \$ 2.00 per share
 - d. \$25.00 per share
 - e. \$27.00 per share

Difficulty level: Medium

STOCK VALUE WITH WARRANTS

- c 33. A firm has 100 shares of stock and 40 warrants outstanding. The warrants are about to expire,

and all of them will be exercised. The market value of the firm's assets is \$2,000, and the firm has no debt. Each warrant gives the owner the right to buy 2 shares at \$15 per share. What is the price per share of the stock?

- a. \$11.11
- b. \$15.00
- c. \$17.78
- d. \$20.00
- e. None of the above.

Difficulty level: Challenge

The following information should be used for problems #34 – 37:
The holders of Xenron Corporation's bond with a face value of \$1,000 can exchange that bond for 35 shares of stock. The stock is selling for \$22.00.

CONVERSION PRICE

- b 34. What is the conversion price?
 - a. \$22.00
 - b. \$28.57
 - c. \$35.00
 - d. \$1,000.00
 - e. No conversion premium is given.

Difficulty level: Medium

CONVERSION PREMIUM

- b 35. What is the conversion premium?
 - a. 0.00%
 - b. 29.86%
 - c. 59.01%
 - d. 106.61%
 - e. None of the above.

Difficulty level: Easy

CONVERSION PRICE AND CONVERSION RATIO

- b 36. What would the conversion price and conversion ratio be if Xenron had a 3 for 1 stock split?
 - a. \$ 7.33; 75
 - b. \$ 9.52; 105
 - c. \$22.00; 25
 - d. \$28.57; 35
 - e. None of the above.

Difficulty level: Medium

CONVERSION VALUE

- c 37. What is the conversion value of the bond?

- a. \$25
- b. \$40
- c. \$770
- d. \$1,000
- e. No conversion premium is given.

Difficulty level: Medium

VALUE OF A CONVERTIBLE BOND

- b 38. A convertible bond has a 8% annual coupon and 15 years to maturity. The face value is \$1,000 and the conversion ratio is 40. The stock currently sells for \$20.875 per share. Similar nonconvertible bonds are priced to yield 9%. The value of the convertible bond is at least:
- a. \$835.00.
 - b. \$919.39.
 - c. \$1,000.00.
 - d. \$1,570.11.
 - e. None of the above.

Difficulty level: Medium

VALUE OF A CONVERTIBLE BOND

- b 39. A convertible bond has an 7% annual coupon and 10 years to maturity. The face value is \$1,000 and the conversion ratio is 35. The stock currently sells for \$27.375 per share. Similar nonconvertible bonds are priced to yield 9%. The value of the convertible bond is at least:
- a. \$ 871.65.
 - b. \$ 958.13.
 - c. \$ 1,000.00.
 - d. \$ 1,325.20.
 - e. None of the above.

Difficulty level: Medium

CONVERSION PREMIUM

- c 40. A convertible bond is selling for \$800. It has 10 years to maturity, a \$1,000 face value, and a 10% coupon. Similar nonconvertible bonds are priced to yield 14%. The conversion price is \$50 per share. The stock currently sells for \$31.375 per share. The conversion premium is:
- a. 37.25%.
 - b. 43.33%.
 - c. 59.36%.
 - d. 66.67%.
 - e. None of the above.

Difficulty level: Medium

IV. ESSAYS

41. A firm has 500 shares of stock and 100 warrants outstanding. The warrants are about to expire, and all

of them will be exercised. The market value of the firm's assets is \$25,000, and the market value of the debt is \$8,000. Each warrant gives the owner the right to buy 5 shares at \$25 per share. What is the value of a warrant?

$$\begin{aligned} \text{Value of a warrant to buy 1 share} &= \\ \{[(\$25,000 - \$8,000) + \$12,500] / 1,000\} - \$25 &= \$4.50 \\ \text{Value of a warrant to buy 5 shares} &= \$4.50 \times 5 = \$22.50 \end{aligned}$$

42. A firm has 2,000 shares of stock and 200 warrants outstanding. The warrants are about to expire, and all of them will be exercised. The market value of the firm's assets is \$14,000, and the firm has no debt. Each warrant gives the owner the right to buy 1 share at \$5. What is the warrant's effective exercise price?

$$\begin{aligned} \text{Value of the warrant} &= \{[\$14,000 + \$1,000] / 2,200\} - \$5.00 = \$1.82 \\ \text{Solve for the exercise price:} \\ \$1.82 &= (2,000 / 2,200) [(14,000 / 2,000) - Ex]; \quad Ex = \$5.00 \end{aligned}$$

43. Kida Consultants has 100,000 shares of stock outstanding. The firm's value net of debt is \$2 million. Kida has 1,000 warrants outstanding with an exercise price of \$18, where each warrant entitles the holder to purchase one share of stock. Calculate the gain from exercising a single warrant.

$$(100,000 / 101,000) [(2,000,000 / 100,000) - \$18] = \$1.98$$

44. Kida Consultants currently has 300,000 shares of common outstanding. Firm value net of debt is \$3,900,000. Kida has warrants outstanding with an exercise price of \$10. How many warrants must the firm have issued if the gain from exercising a single warrant is \$8.25?

$$[300,000 / (300,000 + X)] * \$13.00 = \$8.25; \quad X = 172,727.$$

45. A convertible bond is selling for \$993. It has 15 years to maturity, a \$1,000 face value, and a 8% coupon paid semi-annually. Similar non-convertible bonds are priced to yield 8.5%. The conversion ratio is 20. The stock currently sells for \$47.50 per share. Calculate the convertible bond's option value.

$$\begin{aligned} \text{Value of the Straight Bond} &= \$958.05, \text{ s.a. pricing} \\ \text{Value of the bond converted today} &= 20 \times \$47.50 = \$950.00 \\ \text{The option value must be} &= \$993 - \$958.05 = \$34.95 \end{aligned}$$

46. A convertible bond is selling for \$1,222.70. It has 10 years to maturity, a \$1,000 face value, and a 10% coupon paid semi-annually. Similar non-convertible bonds are priced to yield 8%. The conversion ratio is 40. The stock currently sells for \$30.125 per share. Calculate the convertible bond's option value.

$$\begin{aligned} \text{Value of the Straight Bond} &= \$1,135.90 \\ \text{Value of the bond converted today} &= 40 \times \$30.125 = \$1,205.00 \\ \text{The option value must be} &= \$1,222.7 - \$1,205.00 = \$17.70 \end{aligned}$$

47. A bond/warrant package is priced to sell at face value of \$1,000. Each bond comes with 50 detachable warrants. A warrant gives the owner the right to buy 1 share of stock at \$20 per share. The value of a warrant has been estimated at \$2. The bonds mature in 20 years. Similar bonds without warrants yield

10%. What is the bond's annual coupon?

Set the price of bond/warrant package equal to the value of the straight bond plus the warrant value and solve for the coupon:

$$\$1,000 = \text{Coupon} \times A_{20,.10} + 1000/(1.1)^{20} + (50 \times 2) = \text{Coupon} = \$88.25$$

48. A convertible bond is selling for \$800. It has 10 years to maturity, a \$1000 face value, and a 10% coupon paid semi-annually. Similar nonconvertible bonds are priced to yield 14%. The conversion price is \$50 per share. The stock currently sells for \$31.375 per share. Determine the bond's option premium.

*Minimum Value: greater of $CV = 20 * 31.375 = \$627.50$ or*

$$B_0 = 50 * A_{.07,20} + 1000 PV_{.07,20} = \$788.12$$

$$\text{Option Premium} = \$800 - \$788.12 = \$11.88$$

49. Explain why there is neither a "Free" nor "Expensive Lunch" when convertible bonds are issued?

Convertible bonds are not cheaper or more expensive in an efficient market. One must compare an equivalent basis in an up and down market. One needs to compare both convertible debt versus straight debt, and convertible debt versus common stock. We see that no single alternative will dominate convertibles in both markets.

50. Illustrate and explain how a convertible bond value is based on both debt and equity value. What is the option value?

Refer to page 698-699, Figures 24.2 and 24.3.

Essentially, the option value is difference between market price and highest of conversion value or straight bond value as indicated on the diagram in Figure 24.3 (page 698-699).

SOLUTIONS TO TEST BANK PROBLEMS

Chapter 24

27. $(\text{Price} - \text{Exercise})/\# \text{ Required} = (\$20 - \$17)/1 = \3
28. 25 shares of stock (given)
29. $\$1,000/25 = \40
30. New shares = $15,000/5 = 3,000$
Total shares = $3,000 + 150,000 = 153,000$
Fraction owned $20,000/153,000 = 13.07\%$
31. Total Value/Total # Shares = $[(150,000 \times \$27) + (15,000 \times \$5)] / (150,000 + 3,000)$
 $= \$4,125,000 / 153,000 = \26.96
32. Gain per share = Price per share after exercising – exercise cash paid
 $= \$26.96 - \$25.00 = \$1.96$ (see #31 for share price.)
33. Total Value/Total # Shares = $[\$2,000 + (40(2)\$15)] / [100 + 40(2)] = \$3,200 / 180 = \17.78
34. $\$1,000/35 = \28.57
35. $(\text{Conversion price} / \text{Market Price}) - 1 = [(28.57 / 22) - 1] = .2986 = 29.86\%$.
36. New Conversion Ratio = $35 \times 3 = 105$
New Conversion Price = $\$1,000/\$105 = 9.52 = \$28.57/3; 35(3) = \105
37. CV = Market Price x N = $\$22 \times \$35 = \$770$.
38. Greater of Conversion Value or Straight Bond; CV = $40(\$20.875) = \835
Bond Value = $80 * PVIFA_{.09,15} + 1000 PVIF_{.09,15} = \919.39
39. Greater of: Conversion Value = $27.375(35) = \$958.125$ or
Straight Bond = $70 * PVIFA_{.09,10} = 1000 * PVIF_{.09,10} = \871.65
40. $(50/31.375) - 1 = 59.36\%$