Understanding Financial Management: A Practical Guide
Problems and Answers

Chapter 5
Valuation

5.1 Valuation Fundamentals

1. An analyst wants to estimate the discount rate on a security. The real risk-free rate is 4.5% and the expected inflation rate is 3.2%. Given the characteristics of this investment, the analyst assigns a 5.0% risk premium.
   A. What is the estimated required rate of return on this security?
   B. How much does this amount differ using the exact and the approximation formulas?

2. An analyst estimates the real risk-free rate of return for a financial asset to be 5%, the inflation premium 2%, and the risk premium 7%.
   A. What is the nominal required rate of return for this asset?
   B. By how many basis points does the approximation formula understate or overstate the nominal required rate of return?

5.2 Bond Characteristics and Features

3. Tylor Inc. issued a 15-year, annual-pay bond with a 9% coupon rate and a $1,000 par value. At the time of issue, investors required an 11% rate of return. How much yearly interest will this bond pay?

4. Amertron's floating rate bonds have a par value of $1,000 and are currently trading at 104% of par. The floating rate is based on the 3-month LIBOR plus a margin of 135 basis points with an interest rate cap of 6.50%.
   A. At what price does the bond currently trade?
   B. If the 3-month LIBOR is 5.50% and the bond pays semi-annual coupon payments, what is the current interest rate and coupon payment on the bond?

5.3 Bond Valuation

5. Eiffel Corporation issued an annual-pay bond with a $1,000 par value and an 8% coupon rate 15 years ago. The bond has 5 years remaining until maturity. The risk-free rate is 5%, and the expected inflation premium is 3%. Investors require a 2% risk premium. What is the intrinsic value of the bond?

6. Pixy Inc. issued a 20-year, annual-pay bond with a 9.0% coupon rate and a $1,000 par value. At the time of issue, investors required an 8.8% rate of return.
   A. What was the value of the annual-pay bond when it was issued?

B. Today, the bond has 8 years remaining until maturity and investors expect a required rate of return of 10%. What is the value of the annual-pay bond today?

7. Dual Corporation is offering a 15-year, $1,000 par, 7% semiannual-pay bond. If an investor requires a 9% return on this bond, what is its intrinsic value?

8. Anderson Company has a 20-year, $1,000 par, and 12% semiannual-pay bond. If investors require a 10% rate of return on this bond, what is its intrinsic value?

9. Hobson Corporation is offering a 20-year, zero coupon bond with at a par value of $1,000. Investors require an 8% rate of return
   A. What is the bond's value assuming annual compounding?
   B. What is implied interest earned by the bondholder?
   C. What is the bond's value assuming semi-annual compounding?

10. Lakewood Inc. has a 10-year, zero-coupon bond with a $1,000 maturity value. Assuming semi-annual compounding, what is the intrinsic value of the bond if investors require an 8% rate of return?

5.4 Bond Pricing Relationships

11. Golden Gate Corporation has a bond issue outstanding with a $1,000 par value, and an 8% coupon rate, paid semi-annually. The bond has 12 years until maturity. If the required rate of return 6%, 8%, 14%, what is the value of the bond?

12. Added Value Inc. issued an option-free 15-year, $1,000 par, 8% semiannual-pay bond five years ago.
   A. If investors now require a 10% rate of return on this bond, is the bond selling at a discount or premium? Why?
   B. Now assume that investors require a 6% rate of return on this bond. By what percentage does the value of the bond exceed the par value? What bond pricing property does this illustrate?

5.5 Interest Rate Risk

13. Eagle Corporation has two bonds outstanding. Both bonds have a 7% coupon rate, pay interest semiannually, plus $1,000 at maturity. Bond S matures in 1 year and Bond L matures of 12 years. If the current rate of interest is 6.5%, 7%, and 8%, what is the value of each bond?

5.6 Bond Yields

14. A 10-year bond with a $1,000 par value is currently selling for $1,250. The bond has 9% coupon payments paid semiannually. What is the bond's current yield?

15. Wolfson Company bonds have 9 years remaining until maturity. The bonds have an 8% coupon interest rate, paid annually, and a $1,000 par value. If the bonds are currently trading at a price of $910 or $1,200, what is the yield to maturity?

16. Hamlin Corporation's bonds mature in 10 years. The bonds have a 9% coupon rate, paid semiannually, and a par value of $1,000. If the bonds are currently trading at $925, what is their yield to maturity?

17. Atlas Company has bonds outstanding that will mature in 15 years. The bonds have a 10% coupon rate, paid semiannually, and a par value of $1,000. The bonds currently trade at $1,200 and are first callable in 7 years at a call price of $1,100.
    A. What is the yield to maturity?
    B. What is the yield to first call?

5.8 Preferred Stock Features and Valuation

18. The Reef Inc. has a $25 par value preferred stock that pays an annual dividend of $2. If investors require a 7% return on this preferred stock, what is its intrinsic value?
19. Indies Corporation has preferred stock outstanding with a $100 par value that pays a $5 annual dividend. If investors require a 9% return for this preferred stock, what is its intrinsic value?

20. Beight Corporation has preferred stock that currently sells for $90 per share. If the preferred stock pays an annual dividend of $8, what is the preferred stock's expected rate of return?

21. Assume that the preferred stock of Holmes Corporation is selling for $26 and pays annual dividends of $2.00. Investors require an 8% return because the company has recently been experiencing financial difficulties.
    A. What is the expected rate of return?
    B. Should investors buy the stock?

5.10 Common Stock Valuation

22. An investor plans to buy El Zonte Company common stock and to sell it at the end of three years. The firm's ROE of 12% and its dividend payout policy of 60% are expected to remain constant in the future. The investor forecasts the stock price to be $55 three years from now. The firm paid a dividend of $1.50 last year. The current nominal risk free rate is 4%, the expected market return is 9%, and El Zonte's beta is 1.3.
    A. What is the firm's growth rate?
    B. What is the amount of the dividends paid in the next three years?
    C. What is the required rate of return?
    D. What is the stock's intrinsic value?

23. An investor plans the buy the common stock in Wonder Corporation with the intention of selling the stock at the end of 3 years. Wonder Corporation just paid a dividend of $1 ($D_0$). Wonder's return on equity (ROE) is 12% and investors expect it to remain at this rate in the future. Wonder's earnings retention rate is 75% and will remain at this level in the future. The investor expects that Wonder's stock price will be $40 at the end of the three years. The current nominal risk-free rate is 4.5%, the market risk premium is 6%, and Wonder's beta is 0.98. What is the intrinsic value of Wonder's common stock?

24. Reef Aquatics Inc. paid a $3.00 dividend last year. Analysts expect the firm's dividends to grow at a constant 5% a year. If investors require a 12% return, what is the intrinsic value of Reef Aquatic's stock?

25. FDR Corporation is expected to pay a dividend of $1.50 per share at the end of the year. Analysts forecast a constant dividend growth rate of 8% per year. If investors require a 16% rate of return, what is the intrinsic value of FDR's common stock?

26. GBA Corporation recently paid a dividend of $3 per share. GBA expects the dividend to grow at a rate of 15% per year for the next 3 years, and then the dividend is expected to grow at a rate of 6% per year thereafter. The current nominal risk-free rate is 5%, the expected market return is 12%, and GBA's stock has a beta of 1.3. What is the value of GBA's stock today?

27. Analysts expect dividends at VN Corporation to grow at a rate of 15% for the next three years, 10% for the following two years, and 6% a year thereafter. The company paid a dividend of $3 per share last year and investors require a return of 14%.
    A. What is the present value of the dividends during the supernormal growth period (first three years)?
    B. What is the present value of the dividends during the moderate growth period (next two years)?
    C. What is the terminal price at the end of the moderate growth period (year 5)?
    D. What is the present value of the terminal price using a 14% required rate of return?
    E. What is the value of the stock today?

28. Gallant Corporation has a policy of a 40% dividend payout ratio. Analysts expect Gallant's dividends to grow at a rate of 6% and investors require a 14% rate of return.
    A. What is Gallant's expected P/E ratio?
    B. If analysts expect Gallant's earnings to be $3.50 next year, what is the value of the stock today?

29. Durand Corporation has an expected dividend payout ratio of 40%, a required rate of return of 11%, and an expected dividend growth rate of 5%.
    A. What is Durand's expected P/E ratio?
    B. If investors expect Durand's next year's earnings to be $2.50, what is the value of the stock today?

Answers

1A. The estimated required rate of return is:

$k = [(1 + RRFR) (1 + INF) (1 + RP)] – 1 = [(1.045) (1.032) (1.050)] – 1 = 1.1324 – 1 = 0.1324$ or 13.24%.

1B. The estimated required rate of return using the approximation formula is:

$k_{approximation} \approx RRFR + INF + RP = 0.045 + 0.032 + 0.050 = 0.1270$ or 12.70%.

The difference equals 13.24% – 12.70% = 0.54%.

2A. The nominal required rate of return is:

$k = [(1 + RRFR) (1 + INF) (1 + RP)] – 1 = [(1.05) (1.02) (1.07)] – 1 = 1.1460 – 1 = 0.1460$ or 14.60%.

2B. The approximation formula understates the nominal required rate of return by 60 basis points (14.60% - 14.00% = 0.60%).

$k_{approximation} \approx RRFR + INF + RP = 0.05 + 0.02 + 0.07 = 0.14$ or 14%.

3. The annual interest on this bond is:

$I = c (M) = 0.09(\$1,000) = \$90$

4A. Since the bond currently trades at 104% of par, it now sells at \$1,040 (\$1,000 x 1.04).

4B. To find the current interest rate, add the 3-month LIBOR of 5.50% and the margin of 1.35 percentage points, which results in an interest rate of 6.85%. Since the bond has an interest rate cap of 6.50%, the current interest rate for the bond is also 6.50%.

To find the coupon payment on the bond, multiply \$1,000 by 0.065. This results in an interest payment of \$65. Since the bond makes semi-annual payments, the coupon payment equals \$65/2 = \$32.50.

5. The bond pays \$80 annually, where $I = 0.08(\$1,000) = \$80$.

The next step is to find the investor's required rate of return on the bond, k_b.

$k_b = [(1 + 0.05) (1 + 0.03) (1 + 0.02)] – 1 = 1.1031 – 1 = 0.1031$ or 10.31%

$$V_b = \sum_{t=1}^{5} \frac{\$80}{(1.1031)^t} + \frac{\$1000}{(1.1031)^5} = \$913.12$$

Using the BA II PLUS® financial calculator, the answer is:

Inputs: 2nd CLR TVM; 5 N; 10.31 I/Y; 80 +/- PMT; 1000 +/- FV; CPT PV
Output: \$913.12.

Thus, the intrinsic value of the bond is $913.12.

6A. The value of the annual-pay bond when it was issued is:

$$V_b = \sum_{t=1}^{20} \frac{\$90}{(1.088)^t} + \frac{\$1{,}000}{(1.088)^{20}} = \$1{,}018.52$$

Using the BA II PLUS® financial calculator, the answer is:
Inputs: 2nd CLR TVM; 20 N; 8.8 I/Y; 90 +/- PMT; 1000 +/- FV; CPT PV
Output: $1,018.52.

6B. The value of the annual-pay bond today is:

$$V_b = \sum_{t=1}^{8} \frac{\$90}{(1.10)^t} + \frac{\$1{,}000}{(1.10)^8} = \$946.65$$

Using the BA II PLUS® financial calculator, the answer is:
Inputs: 2nd CLR TVM; 8 N; 10 I/YR; 90 +/- PMT; 1000 +/- FV; CPT PV
Output: $946.65

7. The value of the bond is:

$$V_b = \sum_{t=1}^{2(15)} \frac{\$70/2}{(1+0.09/2)^t} + \frac{\$1{,}000}{(1+0.09/2)^{2(15)}} = \$837.11$$

Using the BA II PLUS® financial calculator, the answer is:
Inputs: CLR TVM; 30 N; 4.5 I/Y; 35 +/- PMT; 1000 +/- FV; CPT PV
Output: $837.11

8. The intrinsic value of the bond is:

$$V_b = \sum_{t=1}^{2(20)} \frac{\$120/2}{(1+0.10/2)^t} + \frac{\$1{,}000}{(1+0.10/2)^{2(20)}} = \$1{,}171.59$$

Using the BA II PLUS® financial calculator, the answer is:
Inputs: 2nd CLR TVM; 40 N; 5 I/Y; 60 +/- PMT; 1000 +/- FV; CPT PV
Output: $1,171.59.

9A. Assuming annual compounding, the value of the bond is:

$$V_b = \frac{\$1{,}000}{(1+0.08)^{20}} = \$214.55$$

Using the BA II PLUS® financial calculator, the answer is:
Inputs: 2nd CLR TVM; 20 N; 8 I/Y; 1000 +/- FV; CPT PV
Output: $214.55

9B. The implied interest earned by the bondholder is the difference between the bond's par value and the discounted initial price: $1,000 – $214.55 = $785.45.

9C. Assuming semi-annual compounding, the value of the bond is:

$$V_b = \frac{\$1{,}000}{(1+0.08/2)^{2(20)}} = \$208.29$$

Using the BA II PLUS® financial calculator, the answer is:
Inputs: 2nd CLR TVM; 40 N; 4 I/Y; 1000 +/- FV; CPT PV
Output: $208.29.

10. The intrinsic value of the bond is:

$$V_b = \frac{\$1{,}000}{(1+0.08/2)^{2(10)}} = \$456.39$$

Using the BA II PLUS® financial calculator, the answer is:
Inputs: 2nd CLR TVM; 20 N; 4 I/Y; 1000 +/- FV; CPT PV
Output: $456.39

11. Using the BA II PLUS® financial calculator, the value of the bond is:

Required Rate of Return	Inputs	Output
6%	24 N; 3 I/Y; 40 +/- PMT; FV +/- 1000; CPT PV	1,169.36
8%	24 N; 4 I/Y; 40 +/- PMT; FV +/- 1000; CPT PV	1,000.00
14%	24 N; 7 I/Y; 40 +/- PMT; FV +/- 1000; CPT PV	655.92

12A. Assuming a 10% required rate of return, the value of the bond is:

$$V_b = \sum_{t=1}^{2(10)} \frac{\$80/2}{(1+0.10/2)^t} + \frac{\$1{,}000}{(1+0.10/2)^{2(10)}} = \$875.38$$

Using the BA II PLUS® financial calculator, the answer is:
Inputs: 2nd CLR TVM; 20 N; 5 I/Y; 40 +/- PMT; 1000 +/- FV; CPT PV
Output: $875.38
The bond is selling for a $124.52 discount below the $1,000 par value. The value of the bond decreases by $124.52/$1,000 = 12.45% when the required rate of return is 2 percentage points higher than the coupon rate. Since the required rate of return (10%) is greater than the coupon rate (8%), the price of the bond ($875.38) will be less than its par value ($1,000.00).

12B. Assuming a 6% required rate of return, the value of the bond is:

$$V_b = \sum_{t=1}^{2(10)} \frac{\$80/2}{(1+0.06/2)^t} + \frac{\$1{,}000}{(1+0.06/2)^{2(10)}} = \$1{,}148.77$$

Inputs: 20 N; 3 I/Y; 40 +/- PMT; 1000 +/- FV; CPT PV
Output: $1,148.77.

The bond value exceeds the par value by $148.77/$1,000 = 14.78%. When the yield increases by 2 percentage points from 8% to 10%, the bond's value decreases by 12.45% from $1,000.00 to $875.38. When the yield decreases 2 percentage points from 8% to 6%, the bond's value increases by 14.78% from $1,000 to $1,148.77. Thus, the bond pricing property is that as yields change for option-free bonds, bond prices go up faster than they go down.

13. Using the BA II PLUS® financial calculator, the value of each bond is:

Bond	Rate %	Inputs	Output
S	6.5	2 N; 3.25 I/Y; 35 +/- PMT; 1000 +/-FV; CPT PV	1,004.77
S	7.0	2 N; 3.50 I/Y; 35 +/- PMT; 1000 +/-FV; CPT PV	1,000.00
S	8.0	2 N; 4.00 I/Y; 35 +/- PMT; 1000 +/-FV; CPT PV	990.57
L	6.5	24 N; 3.25 I/Y; 35 +/- PMT; 1000 +/-FV; CPT PV	1,041.22
L	7.0	24 N; 3.50 I/Y; 35 +/- PMT; 1000 +/-FV; CPT PV	1,000.00
L	8.0	24 N; 4.00 I/Y; 35 +/- PMT; 1000 +/-FV; CPT PV	923.77

14. The bond's current yield is:

$$CY = \frac{I}{P_b} = \frac{\$90}{\$1{,}250} = 0.0720 = 7.20\%$$

15. The yield to maturity of the bond is:

$$\$910 = \sum_{t=1}^{9} \frac{\$80}{(1+\text{YTM})^t} + \frac{\$1{,}000}{(1+\text{YTM})^9} \Rightarrow \text{YTM} = 9.53\%$$

$$\$1{,}200 = \sum_{t=1}^{9} \frac{\$80}{(1+\text{YTM})^t} + \frac{\$1{,}000}{(1+\text{YTM})^9} \Rightarrow \text{YTM} = 5.17\%$$

Using the BA II PLUS® financial calculator, the yield to maturity of the bond is:

Inputs: 9 N; 910 ± PV; 80 PMT; 1000 FV; CPT I/Y
Output: 9.53%

Inputs: 9 N; 1200 ± PV; 80 PMT; 1000 FV; CPT I/Y
Output: 5.17%

16. Because this is a semiannual-pay bond, I/2 = $45 and 2n = 20.

$$\$925 = \sum_{t=1}^{20} \frac{\$45}{(1 + \text{YTM})^t} + \frac{\$1{,}000}{(1 + \text{YTM})^{20}} \Rightarrow \text{YTM} = 5.1073\% \text{ x } 2 = 10.21\%$$

Using the BA II PLUS® financial calculator, the yield to maturity is:

Inputs: 20 N; 925 ± PV; 45 PMT; 1000 FV; CPT I/Y
Output: 5.1073 x 2 = 10.21%

17A. The yield to maturity is:

$$\$1{,}200 = \sum_{t=1}^{30} \frac{\$50}{(1+\text{YTM})^t} + \frac{\$1{,}000}{(1+\text{YTM})^{30}} \Rightarrow \text{YTM} = 3.8625\% \text{ x } 2 = 7.73\%$$

Using the BA II PLUS® financial calculator, the yield to maturity is:

Inputs: 30 N; 1200 ±PV; 50 PMT; 1000 FV; CPT I/Y
Output: 3.8625 x 2 = 7.73%

17B. The yield to first call is:

$$\$1{,}200 = \sum_{t=1}^{14} \frac{\$50}{(1+\text{YTC}/2)^t} + \frac{\$1{,}100}{(1+\text{YTC}/2)^{14}} \Rightarrow 3.7017\% \text{ x } 2 = 7.40\%$$

Using the BA II PLUS® financial calculator, the yield to first call is:

Inputs: 14 N; 1200 ± PV; 50 PMT; 1100 FV; CPT I/Y
Output: 3.7017 x 2 = 7.40%

18. The intrinsic value of the preferred stock is:

$$V_p = \frac{D_p}{k_p} = \frac{\$2}{0.07} = \$28.57$$

19. The value of the preferred stock is:

$$V_p = \frac{D_p}{k_p} = \frac{\$5}{0.09} = \$55.56$$

20. The expected rate of return on the preferred stock is:

$$\hat{k}_p = \frac{D_p}{P_p} = \frac{\$8}{\$90} = 8.89\%$$

21A. The expected rate of return on the preferred stock is:

$$\hat{k}_p = \frac{D_p}{P_p} = \frac{\$2}{\$26} = 7.69\%$$

21B. With a required rate of return of 8%, this stock looks unattractive because the expected rate of return is only 7.69%.

22A. The firm's growth rate is:

g = (1 – Dividend Payout)(ROE) = (1 - 0.60)(0.12) = 4.8%.

22B. Dividends over the next three years are:

$D_1 = D_0(1 + g) = \$1.50(1.048) = \$1.57$
$D_2 = D_1(1 + g) = \$1.57(1.048) = \$1.65$
$D_3 = D_2(1 + g) = \$1.65(1.048) = \$1.73$

22C. Using the CAPM, the required rate of return is:

$k_s = R_f + ß_i(R_m – R_f) = 0.04 + 1.3(0.09 – 0.04) = 10.50\%$

22D. The stock's intrinsic value is:

$$V_s = \frac{\$1.57}{(1.105)} + \frac{\$1.65}{(1.105)^2} + \frac{\$1.73 + \$55.00}{(1.105)^3} = \$1.42 + \$1.35 + 42.05 = \$44.82$$

23. Use the following steps to estimate the value of Wonder's common stock.

- *Forecast the dividend per share for each period.* Start by determining the growth rate (g), then forecast the dividend for the next three years. Finding the growth rate involves using the following formula:

  g = (RR)(ROE) = (0.75)(0.12) = 0.0900 or 9.00%

  Now calculate the dividends for the next three years:

  $D_1 = D_0(1 + g) = \$1.00(1.09) = \$1.09$
  $D_2 = \$1.09(1.09) = \$1.19$
  $D_3 = \$1.19(1.09) = \$1.30$

- *Estimate the expected price of the stock at the end of the holding period.* This information is already given at $40 at the end of three years.

- *Estimate the required rate of return.* Using CAPM results in a required rate of return of $k_s = 0.045 + 0.98(0.06) = 0.1038$ or 10.38%.

- *Discount the expected dividends and the terminal price at the required rate of return.*

$$V_s = \frac{\$1.09}{(1.1038)} + \frac{\$1.19}{(1.1038)^2} + \frac{\$1.30 + \$40}{(1.1038)^3} = \$0.99 + \$0.98 + \$30.71 = \$32.68$$

24. The intrinsic value of the common stock is:

$$V_s = \frac{(\$3.00)(1.05)}{0.12 - 0.05} = \$45.00$$

25. The intrinsic value of FDR's common stock is:

$$V_s = \frac{\$1.50}{0.16 - 0.08} = \$18.75$$

26. Use the following steps to calculate the value of GBA's stock.

- *Estimate the required rate of return.* Using CAPM results in a required rate of return of $k_s = 0.05 + 1.3(0.12 - 0.05) = 0.1410$ or 14.10%.

- *Find the present value of the dividends during the supernormal growth period.*

$$\sum_{t=1}^{3} \frac{\$3.00(1.15)^t}{(1.141)^t}$$

Year t	**Dividend $\$3.00(1.15)^t = D_t$ [1]**	**Discount Factor $1/(1.141)^t$ [2]**	**Present Value [1] x [2]**
1	$\$3.00(1.15) = \$3.45$	0.8764	\$3.02
2	$3.00(1.15)^2 = 3.97$	0.7681	3.05
3	$3.00(1.15)^3 = 4.56$	0.6732	3.07
			Total \$9.14

- *Find the present value of the terminal price at the end of the supernormal growth period.*

  Calculate the terminal price at the end of year 3.

$$P_3 = \frac{D_{n+1}}{k_s - g_2} = \frac{D_3(1+g_2)}{0.141 - 0.060} = \frac{\$4.56(1.06)}{0.081} = \frac{\$4.83}{0.081} = \$59.63$$

  Next, discount the terminal price to the present using the 14.1% required rate of return.

  Present value of $P_3 = \frac{P_3}{(1+k_s)^n} = \frac{\$59.63}{(1.141)^3} = \$40.14$

- *Sum the present value of the dividends during the supernormal growth period and the terminal price in year 3.*

  V_s = \$9.14 + \$40.14 = \$49.28

27A. The present value of the dividends during the supernormal growth period (first three years) is:

$D_1 = D_0(1 + g)$ = \$3.00(1.15)= \$3.45/$(1.14)^1$ = \$3.03
$D_2 = D_1(1 + g)$ = \$3.45(1.15)= \$3.97/$(1.14)^2$ = \$3.05
$D_3 = D_2(1 + g)$ = \$3.9675(1.15)= \$4.56/$(1.14)^3$ = \$3.08
Adding the three discounted cash flows, the PV of the supernormal growth dividends = \$9.16.

27B. The present value of the dividends during the moderate growth period (next two years)?

$D_4 = D_3(1 + g)$ = \$4.56(1.10)= \$5.02/$(1.14)^4$ = \$2.97
$D_5 = D_4(1 + g)$ = \$5.02(1.10)= \$5.52/$(1.14)^5$ = \$2.87
PV of moderate growth periods = \$2.97 + \$2.87 = \$5.84
PV of supernormal and moderate growth period dividends: \$9.16 + \$5.84 = \$15.00.

27C. The terminal price at the end of the moderate growth period (year 5) is:

$$P_5 = \frac{D_{n+1}}{k_s - g_3} = \frac{D_5(1+g_3)}{0.14-0.06} = \frac{\$5.52(1.06)}{0.08} = \frac{\$5.85}{0.08} = \$73.14$$

27D. The present value of the terminal price using a 14% required rate of return is:

$$\text{PV of } P_5 = \frac{P_5}{(1+k_s)^n} = \frac{\$73.14}{(1.14)^5} = \frac{\$73.14}{1.9254} = \$37.99$$

27E. Summing the present values of the dividends during the three-year supernormal growth period, the two-year moderate growth period and the terminal price in year 5, the value of the stock today is: V_s = \$9.16 + \$5.84 + \$37.99 = \$52.99

28A. The expected P/E ratio is: $\frac{P_0}{E_1} = \frac{D_1/E_1}{k_s - g} = \frac{0.40}{0.14-0.06} = 5.00$.

28B. The value of stock is: $(E_1)(P_0/E_1)$ = (\$3.50)(5) = \$17.50.
Alternately, (0.40)(\$3.50)/(0.14 -0.06) = \$17.50

29A. The expected P/E ratio is: $\frac{P_0}{E_1} = \frac{D_1/E_1}{k_s - g} = \frac{0.40}{0.11-0.05} = 6.67$.

29B. The value of the stock is: $(E_1)(P_0/E_1)$ = (\$2.50)(6.67) = \$16.67.
Alternately, (0.40)(\$2.50)/(0.11-0.05) = \$16.67.