

EC5321: Investment & Portfolio Management

Solutions for Problem set 4

1. Which of the following is not considered a basic economic force?
d. P/E ratio
2. The process of fundamental valuation requires estimates of all the following factors, except
d. the time series of stock prices
3. The value of a corporate bond can be derived by calculating the present value of the interest payments & the present value of the face value at the bond's
c. required rate of return
4. Which securities can be valued by dividing the annual dividend by the required rate of return?
d. preferred stocks
5. Dividend growth is a function of
a. return on equity
b. the retention rate
c. the payout ratio
6. Growth rates of the
(1) labour force
(2) average number of hours worked &
(3) labour productivity
are the main determinants of a foreign country's
c. real risk free rate

7. Which of the following factors influence an investor's required rate of return?

- The economy's real risk-free rate (RFR)
- The expected rate of inflation
- a risk premium.

8. Which of the following statements regarding fundamental & relative valuation techniques is true?

a. Both techniques require an appropriate estimate of the required rate of return and the growth rate.

9. The most appropriate discount rate to use when applying the operating free cash flow model is the firm's.

c. weighted average cost of capital (WACC)

10. A major manufacturer is re-evaluating its bonds since it is planning to issue a new bond in the current market.

- The firm's outstanding bond issue has 7 years remaining till maturity.

- The bonds were issued with an 8 per cent coupon rate (paid quarterly) & a par value of £1000.

- The required rate of return is 10 per cent.

- What is the current value of these securities?

$$4 \times 7 = 28$$

$$P = 20 \left[\frac{1 - \frac{1}{(1+0.025)^{28}}}{0.025} \right] + \frac{100}{(1+0.025)^{28}} = 900.17$$

$$P = £900.17$$

$$10\% = \frac{0.1}{2} = 0.05$$

$$\frac{0.08}{2} = \frac{0.08 \times 10.00}{2} =$$

$$\frac{8}{4} = 2 = 0.02$$

11. Refer to Q10.

What will be the value of these securities in one year if the required return is 6 per cent?

$$\left[\frac{1 - \frac{1}{(1+0.015)^{24}}}{0.015} \right] + \frac{1000}{(1+0.015)^{24}} = 1100.15$$

$$\therefore \text{A. } \pm 1100.15$$

12. In 2014, Saursten Inc. issued a €150 par value preferred stock that pays an 8 per cent annual dividend. Due to changes in the overall economy and in the company's financial condition investors are now requiring a 15 per cent return. What price would you be willing to pay for a share of the preferred if you receive your first dividend one year from now?

$$\text{Dividend} = 0.08 \times \text{€}150 = \text{€}12$$

$$\therefore \text{Price} = \frac{12}{0.15} = \text{€}80$$

13. Using the constant growth model, a decrease in the required rate of return from 15 to 13 per cent combined with an increase in the growth rate from 5 to 6 per cent would cause the price to
b. to rise less than 50 per cent

$$\% \Delta = \frac{P_2}{P_1} = \frac{[(D_0)(1+g_2)/(k_2-g_2)]}{[(D_0)(1+g_1)/(k_1-g_1)]} - 1$$

$$= \frac{[(D_0)(1+0.06)/(0.13-0.06)]}{[(D_0)(1+0.05)/(0.15-0.05)]} - 1$$

$$= (15.14 \div 10.5) - 1 = 44.22\% < 50\%$$

14. Davenport Corporation's last dividend was \$2.70 & the directors expect to maintain the historic 3 per cent annual rate of growth. you plan to purchase the stock today because you feel that the growth rate will increase to 5 per cent for the next three years & the stock will then reach \$25 per share.

How much should you be willing to pay for the stock if you required a 17 per cent return?

$$P = \frac{2.7(1.05)}{1.17} + \frac{2.7(1.05)^2}{(1.17)^2} + \frac{2.7(1.05)^3}{(1.17)^3} + \frac{25.00}{(1.17)^3}$$

$$= 22.16 \quad \therefore \text{b. } \$22.16.$$

15. Refer to Q14. How much should you be willing to pay for the stock if you feel that 5 per cent growth rate can be maintained indefinitely & you require a 17 per cent return?

$$P = (2.70 \times 1.05) \div (0.17 - 0.05) = \$23.63$$

Question 2:

Earnings per share: last year \$10.00

Dividends per share: last year \$6.00

Estimated earnings per share: this year \$11.00

Required rate of return 12%

Expected sales price at end of year \$132.00

The Baron Basket Ball Company (BBC) earned \$10 a share last year and paid a dividend of \$6 a share. Next year, you expect BBC to earn \$11 & continue its payout ratio. Assume that you expect to sell the stock for \$132 a year from now. if you require 12% on this stock, how much would you be willing to pay for it?

Question 2; continue.

Since the last dividend payout ratio $= \frac{\$6.00}{\$10.00} = 60\%$

and assuming you maintain the same payout ratio, then dividends per share at the end of the year is:

$$\text{EPS} \times \text{Payout} = \$11.00 \times 60\% \\ = \$6.60$$

\therefore the present value of BBC's share is:

$$\text{Value} = \frac{\$6.60}{(1+0.12)} + \frac{\$132.00}{(1+0.12)} = \$5.89 + \text{~~111~~} \$117.86 = \$123.75$$

So, \$123.75 is the maximum price you would be willing to pay for BBC's stock.

Question 3

The income statement and Balance sheet of Gambit Inc. are given below. You are asked to use the Dividend Discount Model (DDM) to determine the value of Gambit Inc. You anticipate that Gambit's earnings & dividends will grow at 32% for two years & then 13% thereafter.

| <u>Income Statement</u> | | | <u>Balance Sheet</u> | | |
|-------------------------|----------|--------|----------------------------|----------------|----------------|
| | 2012 (£) | 2013 | | 2012 | 2013 |
| Revenue | 474 | 598 | Current assets | 201 | 326 |
| Depreciation | 20 | 23 | Net Property, | 474 | 489 |
| Other operating costs | 368 | 460 | Plant & equipment | | |
| Income before Taxes | 86 | 115 | Total assets | 675 | 815 |
| Taxes | 26 | 35 | Long-term debt | 0 | 0 |
| Net Income | 60 | 80 | Total liabilities | 57 | 141 |
| Dividends | 18 | 24 | Shareholders equity | 618 | 674 |
| Earnings per share | £0.74 | £0.952 | Total liabilities & equity | 675 | 815 |
| Dividend per share | £0.214 | £0.286 | capital Expenditure | 34 | 38 |

Required rate of return on equity 14%
 Growth rate of industry 13%
 Industry P/E ratio 26

Calculate the current value of a share of Gambit stock by using a two-stage DDM and the data from the Income Statement and the balance Sheet.

(Hint: find what proportion of Earnings is paid out as Dividends first in order to calculate D_1 , Dividends in period 1)

Year 2013 is $t=0$ and 2014 is $t=1$, & so on...

$$E_0 = £0.952 \quad D_0 = £0.286$$

$$\frac{D_0}{E_0} = 0.30$$

(The same ratio is obtained, for comparison purposes, from the 2012 data)

$$V_0 = \frac{D_1}{(1+k)^1} + \frac{D_2}{(1+k)^2} + \frac{\frac{D_3}{(k-g)}}{(1+k)^2}$$

$$E_1 = E_0 (1+0.32)^1 = £0.952 \times 1.32 = £1.2566$$

$$D_1 = E_1 \times 0.3 = £1.2566 \times 0.3 = £0.3770$$

$$E_2 = E_0 (1+0.32)^2 = £1.6588$$

$$D_2 = E_2 \times 0.3 = £0.4976$$

$$E_3 = E_0 (1+0.32)^2 \times (1+13)^1 = £1.8744$$

$$D_3 = E_3 \times 0.3 = £0.5623$$

$$V_0 = \frac{0.3770}{(1+0.14)^1} + \frac{0.4976}{(1+0.14)^2} + \frac{\frac{0.5623}{(0.14-0.13)}}{(1+0.14)^2} = \frac{43.98}{\text{£}}$$

The value of one Gambit stock is £43.98