In-class Test
FINA 0025 – Financial Management

Question 1

  a) What are the main reasons why a pound tomorrow is worth less than a pound today?

  b) What happens to bond values if required return is not equal to the coupon rate?

  c) A UK Treasury bond has a 10 percent coupon rate and a £1,000 face value. Interest is paid semi-annually, and the bond has 5 years to maturity. If investors require a 12 percent yield, what is the bond's value?

  d) Greenwich Corporation common stock paid £1.57 in dividends last year and is expected to grow indefinitely at an annual 5-percent rate. What is the value of the stock if you require a 9 percent return?

Question 2

You own 250 shares of Dalton Resources preferred stock, which currently sells for $38.50 per share and pays annual dividends of $3.25 per share.

  a. What is your expected return?

  b. If you require an 8-percent return, given the current price, should you sell or buy more stock?

Question 3

Blackburn & Smith common stock currently sells for $23 per share. The company's executives anticipate a constant growth rate of 10.5 percent and an end-of-year dividend of $2.50.

  a. What is your expected rate of return?

  b. If you require a 17-percent return, should you purchase the stock?

Question 4

Sunn Co.'s bonds, maturing in 7 years, pay 8 percent interest on a $1,000 face value. However, interest is paid semiannually. If your required rate of return is 10 percent, what is the value of the bond? How would your answer change if the interest were paid annually?

Question 5

  a) The present value of investing in a stock should not depend on how the investor plans to hold it. Explain why?

  b) A key input for the Gordon Growth Model is the expected growth rate in dividends over the long term. How, if at all, would you factor in the following considerations in estimating this growth rate?

   a. There is a increase in the inflation rate.
   b. The economy in which the firm operates is growing very rapidly.

c) Medtronic Inc., the world's largest manufacturer of implantable biomedical devices, reported earnings per share in 1993 of $3.95, and paid dividends per share of $0.68. Its earnings are expected to grow 16% from 1994 to 1998, but the growth rate is expected to decline each year after that to a stable growth of 6% in 2003. The payout ratio is expected to remain unchanged from 1994 to 1998, after which it will increase each year to reach 60% in steady state. The firm's required return is 11.75%.

    a. Assuming that the growth rate declines linearly (and the payout ratio increases linearly) from 1999 to 2003, estimate the dividends per share each year from 1994 to 2003.

    b. Estimate the expected price at end of 2003.

SOLUTIONS

Question 1
a)

- Individuals ***prefer present consumption to future consumption***. To induce people to give up present consumption you have to offer them more in the future.

- When there is **monetary *inflation***, the value of currency decreases over time. The greater the inflation, the greater the difference in value between a dollar today and a dollar tomorrow.

- If there is any ***uncertainty (risk)*** associated with the cash flow in the future, the less that cash flow will be valued

b)

The bond's value will differ from its par value.
R > Coupon Interest Rate→ P_0 < par value → **DISCOUNT**
R < Coupon Interest Rate → P0 > par value → **PREMIUM**

c)

Because the bond has a 10 percent coupon yield and investors require a 12 percent return, we know that the bond must sell a discount. Notice that, because the bond pays interest semi-annually, the coupons amount to £100/2 = £50 every six months. The require yield is 12%/2=6%. Finally, the bond matures in 5 years, so there are a total of 10 six-month periods. The bond's value is thus equal to the present value of £50 every six months for the next 10 six-month periods plus the present value of the £1,000 face amount.

$$\text{Bond value} = £50\times\left(1-1/1.06^{10}\right)/0.06+1{,}000/1.06^{10}$$
$$= £50\times 7.36+1{,}000/1.7908$$
$$= \mathbf{£926.40}$$

d)

$$\text{Value} = \left(\frac{\text{last year dividend}\times(1+\text{growth rate})}{\text{required rate of return}-\text{growth rate}}\right) = \frac{\$1.57\times(1.05)}{0.09-0.05} = £41.2125$$

Question 2

a. $\text{Expected Return} = \dfrac{\text{dividend}}{\text{market price}} = \dfrac{\$3.25}{\$38.50} = 0.0844 = 8.44\%$

Given your 8 percent required rate of return, the stock is worth $40.62 to you:

b. $\text{Value} = \dfrac{\text{dividend}}{\text{required rate of return}} = \dfrac{\$3.25}{0.08} = \$40.62$

Because the expected rate of return (8.44%) is greater than your required rate of return (8%) or because the current market price ($38.50) is less than $40.62., the stock is undervalued and you should buy.

Question 3

c. Expected rate of return $E_R = \dfrac{\text{dividend in year1}}{\text{market price}} + \text{growth rate}$

$$E_R = \frac{\$2.50}{\$23.00} + 0.105 = 0.2137$$

$$E_R = 21.37\%$$

d. Value $= \dfrac{\$2.50}{0.17 - 0.105} = \$38.46$

The expected rate of return exceeds your required rate of return, which means that the value of the security to you is greater than the current market price. Thus, you should buy the stock.

Question 4

If interest is paid semiannually:

$$\text{Value} = \sum_{t=1}^{14} \frac{\$40}{(1.05)^t} + \frac{\$1,000}{(1.05)^{14}}$$

Thus,

$$\$40\,(9.899) \quad = \$ \quad 395.96$$
$$\$1,000\,(0.505) = \$ \quad 505.00$$
$$\textbf{Value} \; = \$ \; \textbf{900.96}$$

If interest is paid annually:

$$\text{Value} = \sum_{t=1}^{7} \frac{\$80}{(1.10)^t} + \frac{\$1,000}{(1.10)^7}$$

$$\$80\,(4.868) + \$1,000\,(0.513)$$
$$\textbf{Value} \; = \$ \; \textbf{902.44}$$

Question 5

a) The value of a share is the discounted value of all expected dividends. Even if the investor plans to hold a stock for only 5 years, for example, then, at the time that the investor plans to sell the stock, it will be worth the discounted value of all expected dividends from that point on. In fact, that is the value at which the investor expects to sell the stock. Therefore, the present value of the stock today is the present value of the year

five value of the stock. This latter amount is the present value today of all expected dividend payments after year five.

b)
    a. This would suggest a higher growth rate.
    b. This would also suggest a higher growth rate, since the nominal growth = real growth rate + inflation rate

c)

Stage	Year	Growth rate in Earnings	Payout ratio	Earnings	Dividends
	1993			3.95	0.68
Growth	1994	0.16	0.172152	4.582	0.7888
Growth	1995	0.16	0.172152	5.31512	0.915008
Growth	1996	0.16	0.172152	6.165539	1.061409
Growth	1997	0.16	0.172152	7.152025	1.231235
Growth	1998	0.16	0.172152	8.29635	1.428232
Transition	1999	0.14	0.257722	9.457838	2.437489
Transition	2000	0.12	0.343291	10.59278	3.636407
Transition	2001	0.10	0.428861	11.65206	4.99711
Transition	2002	0.08	0.51443	12.58422	6.473706
Stable	2003	0.06	0.6	13.33927	8.003565
Stable	2004	0.06	0.6	14.13963	8.483779

The share price at the end of 2003 is equal to:

$$\frac{8.48}{0.1175-0.06} = \$147.48$$