

EXERCISES -3 (SOLUTIONS)

$$1. P_A = \frac{D_1}{r} = \frac{\$10}{0.10} = \$100.00$$

$$P_B = \frac{D_1}{r - g} = \frac{\$5}{0.10 - 0.04} = \$83.33$$

$$P_C = \frac{D_1}{1.10^1} + \frac{D_2}{1.10^2} + \frac{D_3}{1.10^3} + \frac{D_4}{1.10^4} + \frac{D_5}{1.10^5} + \frac{D_6}{1.10^6} + \left(\frac{D_7}{0.10} \times \frac{1}{1.10^6} \right) =$$

$$= \frac{5.00}{1.10^1} + \frac{6.00}{1.10^2} + \frac{7.20}{1.10^3} + \frac{8.64}{1.10^4} + \frac{10.37}{1.10^5} + \frac{12.44}{1.10^6} + \left(\frac{12.44}{0.10} \times \frac{1}{1.10^6} \right) = \$104.50$$

For the market capitalization rate of 10% stock C is the more valuable. For $r = 7\%$ the calculations are similar and give:

$$P_A = \$142.86$$

$$P_B = \$166.67$$

$$P_C = \$156.48$$

Thus stock B is more valuable.

2. a. We construct the following table.

	Forecasted earnings and dividends						
	Year						
	0	1	2	3	4	5	6
Book equity	50.000	53.500	57.245	61.252	65.540	70.128	71.741
EPS	7.000	7.490	8.014	8.575	9.176	8.065	8.250
ROE	0.140	0.140	0.140	0.140	0.140	0.115	0.115
Plowback ratio	0.500	0.500	0.500	0.500	0.500	0.200	0.200
Dividends	3.500	3.745	4.007	4.288	4.588	6.452	6.600
Growth rate of dividends	0.070	0.070	0.070	0.070	0.070	0.406	0.023

We observe that dividends increase at 7% for the first 4 years. At year 5 the payout ratio increases to 80% which causes dividends to grow at 86.4%. Thereafter, the dividend growth rate is expected to be only 2.3%.

- b. The price of the stock is

$$P_0 = \frac{3.745}{(1.115)} + \frac{4.007}{(1.115)^2} + \frac{4.288}{(1.115)^3} + \frac{4.588}{(1.115)^4} + \left(\frac{1}{(1.115)^4} \times \frac{6.452}{(0.115 - 0.023)} \right) = \$59.77$$

$$3. a. P_0 = \frac{D_1}{r - g} \Rightarrow r = \frac{D_1}{P_0} + g = \frac{8.5}{200} + 0.075 = 11.75\%$$

- b. We have that plowback ratio = 1 – payback ratio = 1 – 0.5 = 0.5, and,
 $g = \text{plowback ratio} \times \text{ROE} = 0.5 \times 0.12 = 0.06$

Thus,

$$P_0 = \frac{D_1}{r - g} \Rightarrow r = \frac{D_1}{P_0} + g = \frac{8.5}{200} + 0.06 = 10.25\%$$

Since g should be revised downward, the expected rate of return is also smaller to the estimate given in part (a).

4. a. Growth-Tech's stock price should be:

$$P_0 = \frac{\$0.50}{(1.12)} + \frac{\$0.60}{(1.12)^2} + \frac{\$1.15}{(1.12)^3} + \left(\frac{1}{(1.12)^3} \times \frac{\$1.24}{(0.12 - 0.08)} \right) = \$23.81$$

- b. The horizon value contributes:

$$PV(P_H) = \frac{1}{(1.12)^3} \times \frac{\$1.24}{(0.12 - 0.08)} = \$22.07$$

- c. Without PVGO, P_3 would equal earnings for year 4 capitalized at 12 percent:

$$\frac{\$2.49}{0.12} = \$20.75$$

Therefore: $PVGO = \$31.00 - \$20.75 = \$10.25$

- d. The PVGO of \$10.25 is lost at year 3. Therefore, the current stock price of \$23.81 will decrease by:

$$\frac{\$10.25}{(1.12)^3} = \$7.30$$

The new stock price will be: $\$23.81 - \$7.30 = \$16.51$

5. The stock price will decrease. The stock price already reflects an expected 25% increase. The 20% increase conveys bad news relative to expectations.

6.

- Statement (a) does not violate the EMH. As municipal bonds are tax exempt they should offer a lower return than government bonds, so that the after-tax return to be the same.
- Statement (b) appears to violate market efficiency. It implies that managers have private information, which is not priced in the market, which they can exploit in order to make superior returns.
- Statement (c) does not indicate market inefficiency. It just implies that the change in profits observed in the future, is already priced in the market.
- Statement (d) appears to violate the EMH. The history of the stock cannot provide any information about the future course of the stock. This depends on the value of the stock, which in turn depends on the expected cash flows and the expected returns that the market require.
- Statement (e) does not indicate market inefficiency. It just implies that the market expects that this merger would be successful, which explains the rise in the stock price.
- Statement (f) appears to violate market efficiency. It implies that the market does not react instantaneously to the arrival of new information contained in the earning announcements.

- g. Statement (g) does not violate the EMH. Investors exposed to higher levels of risk require a higher expected return in order to be compensated for this exposure.
7. The efficient market hypothesis says that there is no easy way to make money. Thus, when such an opportunity seems to present itself, we should be very skeptical. For example:
- a. In the case of short- versus long-term rates, and borrowing short-term versus long-term, there are different risks involved. For example, suppose that we need the money long-term but we borrow short-term. When the short-term loan is due, we must somehow refinance. However; this may not be possible, or may be possible only at a very high interest rate.
 - b. In the case of Japanese versus United States interest rates, there is the risk that the Japanese yen - U.S. dollar exchange rate will change during the period of time for which we have invested.