FIN 302 Homework Solution Ch6

1. Price = P_0 = Dividend/Dividend yield = DIV_1/r = 4.30/0.034 = 126.47 kroner

2. The preferred stock pays a level perpetuity of dividends. The expected dividend next year is the same as this year's dividend ($8).

   a. $8.00/0.12 = $66.67

   b. $8.00/0.12 = $66.67

   c. Dividend yield = $8/$66.67 = 0.12 =12%

      Capital gains yield = 0

      Expected rate of return = 12%

3. $r = DIV_1/P_0 + g$ = 8% + 6% = 14%

4. a. $P_0 = DIV_1/(r - g)$

      $30 = $3/(r – 0.04) ⇒ r = 0.14 = 14%

   b. P_0 = $3/(0.165 – 0.04) = $24

5. a. $P_0 = \dfrac{\$2.40}{0.12 - 0.04} = \$30.00$

   b. No-growth value = E/r = $3.10/0.12 = $25.83

      PVGO = P_0 – No-growth value = $30 – $25.83 = $4.17

7.

		Stock A	Stock B
a.	Payout ratio	$1/$2 = 0.50	$1/$1.50 = 0.667
b.	g = ROE × plowback ratio	15% × 0.5 = 7.5%	10% × 0.333 = 3.33%
c.	$\text{Price} = \dfrac{DIV_1}{r - g}$	$\dfrac{\$1}{0.15 - 0.075} = \$13.33$	$\dfrac{\$1}{0.15 - 0.0333} = \$8.57$

14. a. $$P_0 = \frac{DIV_1}{r-g} = \frac{\$3 \times 1.05}{0.15 - 0.05} = \$31.50$$

b. $$P_0 = \frac{\$3 \times 1.05}{0.12 - 0.05} = \$45$$

The lower discount rate makes the present value of future dividends higher.

16. a. $P_0 = DIV_1/(r - g) = \$3/[0.15 - (-0.10)] = \$3/0.25 = \$12$

b. $P_1 = DIV_2/(r - g) = \$3(1 - 0.10)/0.25 = \$10.80$

b. expected rate of return =

$$\frac{DIV_1 + \text{Capital gain}}{P_0} = \frac{\$3 + (\$10.80 - \$12)}{\$12} = 0.150 = 15.0\%$$

d. 'Bad companies' may be declining, but if the stock price already reflects this fact, the investor can still earn a fair rate of return, as shown in part (c).

18. a. (i) reinvest 0% of earnings: g = 0 and $DIV_1 = \$6$

$$P_0 = \frac{DIV_1}{r-g} = \frac{\$6}{0.15 - 0} = \$40.00$$

(ii) reinvest 40%: $g = 15\% \times 0.40 = 6\%$ and $DIV_1 = \$6 \times (1 - 0.40) = \$3.60$

$$P_0 = \frac{DIV_1}{r-g} = \frac{\$3.60}{0.15 - 0.06} = \$40.00$$

(iii) reinvest 60%: $g = 15\% \times 0.60 = 9\%$ and $DIV_1 = \$6 \times (1 - 0.60) = \$2.40$

$$P_0 = \frac{DIV_1}{r-g} = \frac{\$2.40}{0.15 - 0.09} = \$40.00$$

b. (i) reinvest 0%: $$P_0 = \frac{\$6}{0.15 - 0} = \$40.00 \Rightarrow \text{PVGO} = \$0$$

(ii) reinvest 40%: $$P_0 = \frac{\$3.60}{0.15 - (0.2 \times 0.40)} = \$51.43 \Rightarrow$$

PVGO = \$51.43 – \$40.00 = \$11.43

(iii) reinvest 60%: $$P_0 = \frac{\$2.40}{0.15 - (0.2 \times 0.60)} = \$80.00 \Rightarrow$$

PVGO = \$80.00 – \$40.00 = \$40.00

c. In part (a), the return on reinvested earnings is equal to the discount rate. Therefore, the NPV of the firm's new projects is zero, and PVGO is zero in all cases, regardless of the reinvestment rate. While higher reinvestment results in higher growth rates, it does not result in a higher value of growth opportunities. This example illustrates that there is a difference between growth and growth opportunities.

In part (b), the return on reinvested earnings is greater than the discount rate. Therefore, the NPV of the firm's new projects is positive, and PVGO is positive. In this case, PVGO is higher when the reinvestment rate is higher because the firm is taking greater advantage of its opportunities to invest in positive NPV projects.

21. a. g = ROE × plowback ratio = 20% × 0.30 = 6%

b. E = \$3, r = 0.12 $\Rightarrow P_0 = \frac{\$3 \times (1 - 0.30)}{0.12 - 0.06} = \$35.00$

c. No-growth value = E/r = \$3/0.12 = \$25.00

PVGO = P_0 – No-growth value = \$35 – \$25 = \$10

d. P/E = \$35/\$3 = 11.667

e. If all earnings were paid as dividends, price would equal the no-growth value (\$25) and P/E would be: \$25/\$3 = 8.333

f. High P/E ratios reflect expectations of high PVGO.

23. For Blanco:

DIV_1 = 0.90 × €2.20 = €1.98

g = 0.10 × ROE

$$P_0 = \frac{1.98}{r - 0.10ROE} = 20.00$$

For Grigio:

DIV_1 = 0.10 × €2.20 = €0.22

g = 0.90 × ROE

$$P_0 = \frac{0.22}{r - 0.90ROE} = 20.00$$

DIV_1 is larger for Blanco than for Grigio, but g is larger for Grigio than for Blanco. These two effects are exactly offsetting if r = 11% and ROE = 11% so that P_0 = €20 for both Blanco and Grigio. In this case, the numerator of the perpetual growth formula for Blanco is nine times the numerator for Grigio, and the denominator for Blanco is nine times the denominator for Blanco.

29. a. $DIV_1 = \$2 \times 1.20 = \$2.40$

b. $DIV_1 = \$2.40$ $DIV_2 = \$2.88$ $DIV_3 = \$3.456$

$$P_3 = \frac{\$3.456 \times 1.04}{0.15 - 0.04} = \$32.675$$

$$P_0 = \frac{\$2.40}{1.15} + \frac{\$2.88}{(1.15)^2} + \frac{\$3.456 + \$32.675}{(1.15)^3} = \$28.021$$

30. a. $$P_0 = \frac{\$2.88}{1.15} + \frac{\$3.456 + \$32.675}{(1.15)^2} = \$29.825$$

Capital gain = $P_1 - P_0 = \$29.825 - \$28.021 = \$1.804$

b. $$r = \frac{\$2.40 + \$1.804}{\$28.021} = 0.1500 = 15.00\%$$

19. No, this does not invalidate the dividend discount model. The dividend discount model allows for the fact that firms may not *currently* pay dividends. As the market matures, and Amazon’s growth opportunities moderate, investors may justifiably believe that Amazon will enjoy high future earnings and will then pay dividends. The stock price today can still reflect the present value of the expected per share stream of dividends.

22. The value of a share of common stock equals the present value of dividends received out to the investment horizon, plus the present value of the forecast stock price at the horizon. But the stock price at the horizon date depends on expectations of dividends from that date forward. So, even if an investor plans to hold a stock for only a year or two, the price ultimately received from another investor depends on dividends to be paid after the date of purchase. Therefore, the stock’s present value is the same for investors with different time horizons.

32. a. An individual *can* do crazy things and not affect the efficiency of financial markets. An irrational person can give assets away for free or offer to pay twice the market value. However, when the person’s supply of assets or money runs out, the price will adjust back to its prior level (assuming that there is no new, relevant information released by these actions). If you are lucky enough to trade with such a person you *will* receive a positive gain at that investor’s expense. You had better not count on this happening very often though. Fortunately, an efficient market protects irrational investors in cases less extreme than the above. Even if they trade in the market in an ‘irrational’ manner, they can be assured of getting a fair price since the price reflects all information.

b. Yes, and how many people have dropped a bundle? Or more to the point, how many people have made a bundle only to lose it later? People can be lucky and some people can be very lucky; efficient markets do not preclude this possibility.

c. Investor psychology is a slippery concept, more often than not used to explain price movements that the individual invoking it cannot personally explain. Even if it exists, is there any way to make money from it? If investor psychology drives up the price one day, will it do so the next day also? Or will the price drop to a ‘true’ level? Almost no one can tell you beforehand what ‘investor psychology’ will do. Theories based on it have no content.