



FNCE10002 Principles of Finance
Semester 1, 2019

Valuation of Equity Securities
Suggested Answers to Tutorial Questions for Week 4

Note that detailed answers to tutorial questions from Part II will only be provided in tutorials. The following abridged answers are intended as a guide to those detailed answers. This policy is in place to ensure that you attend your tutorial regularly and receive timely feedback from your tutor. If you are unsure of your answers you should check with your tutor, a pit stop tutor, online tutor or me.

While detailed answers to Part I appear below, if you are not sure of the answers to these questions please ask your tutor in the following week's tutorial.

Part I – Answers Submitted to Your Tutor

A. Problems

- A1. a) The firm's return on equity (r_E) is expected to remain unchanged. Based on the dividend and price before the announcement, we can estimate the return on equity as follows:

$$r_E = D_1/P_0 + g = 4.00/50.00 + 0.03 = 11\%.$$

The new share price after the change in future dividends and their growth rate is:

$$\text{New } P_0 = 2.50/(0.11 - 0.05) = \$41.67.$$

- b) In this case, cutting the dividend to expand operations is not a positive *NPV* investment because it results in the value of the firm falling as indicated by the fall in the share price.

- A2. a) *Information given:* $E_0 = \$3.00$, Payout ratio (α) = 40%, $g = 5\%$, $r_E = 12\%$.

The dividend per share expected in year 1 is:

$$D_1 = \alpha E_0(1 + g) = (0.40)3.00(1 + 0.05) = \$1.26.$$

The price per share today is:

$$P_0 = D_1/(r_E - g).$$

$$P_0 = 1.26/(0.12 - 0.05) = \$18.00.$$

- b) *Information given:* $E_0 = \$3.00$, Payout ratio (α) = 40%, $g_1 = -10\%$ (years 1 – 3), $g_2 = 5\%$ (years 4 onwards), $r_E = 12\%$.

$$D_1 = (0.40)3.00(1 - 0.10) = \$1.0800.$$

$$D_2 = D_1(1 - 0.10) = \$0.9720.$$

$$D_3 = D_2(1 - 0.10) = \$0.8748.$$

$$D_4 = D_3(1 + 0.05) = \$0.9185.$$

$$P_3 = 0.9185/(0.12 - 0.05) = \$13.122.$$

$$P_0 = D_1/(1 + r_E) + D_2/(1 + r_E)^2 + (D_3 + P_3)/(1 + r_E)^3.$$

$$P_0 = 1.0800/(1.12) + 0.9720/(1.12)^2 + (0.8748 + 13.122)/(1.12)^3.$$

$$P_0 = \$11.70.$$

- c) The value of the underlying stock derived using the dividend discount model is very sensitive to the estimated growth rate in dividends. In this case, the price is 35% lower (= $(11.70 - 18.00)/18.00$) relative to the original estimate of \$18.00 when we change the growth rate assumptions for just the first three years. Clearly, the growth in dividends in the earlier years will make a big difference to the price today.

A3. a) $P_0 = 8.00/0.06 = \$133.33.$

b) $P_0 = 60.00 = 10.00/r_p.$

$$\text{So, } r_p = 10.00/60.00 = 0.167 \text{ or } 16.7\%.$$

c) $P_0 = 80.00 = D_p/0.10.$

$$\text{So, } D_p = 80.00(0.10) = \$8.00.$$

Part II – Submission of Answers Not Required

B. Short Answer Questions

- B1. a) False. The model is ideally suited for valuing firms that have a history of paying a regular dividend or are expected to pay a regular dividend in the future.
- b) False. In this model g refers to the growth rate of *future* dividends.
- c) False. In this model $(r_e - g)$ must be greater than zero.
- B2. a) A rise in the growth rate in dividends (g) will result in the P/E ratio to rise.
- b) A fall in the retention ratio $(1 - \alpha)$ would raise the P/E ratio.
- c) A fall in the earnings per share would result in the P/E ratio rising.

C. Multiple Choice Questions

- C1. C is correct. HCA's shares can be valued as the present value of a deferred perpetuity that grows

at a constant rate. The dividend in year 4 is \$1.00 which is expected to grow at a constant rate of 5% p.a. So, the price at the end of year 3 is \$20.00 and the price today is \$15.03.

- C2. D is correct. Using the constant dividend discount model and a given price we can calculate the growth rate in dividends as 9%.
- C3. D is correct. We're given the dividend today so we first need to calculate the dividend at the end of year 1. Using the constant dividend discount model, the price today is \$15.75.
- C4. D is correct. The price equals the dividend in year 1, growing at 7% forever. Based on the price of \$12.14 the implied expected return is 14.49%.
- C5. B is correct. The dividend per share at time 1 is \$1.05. Using the constant dividend discount model results in a current price of \$7.00.

D. Problems and Case Studies

- D1. a) We get the price at the end of year n as: $P_n = P_{n-1}(1 + g)$.

The present value of the price at year 0 is: $PV_0(P_n) = P_n / (1 + r_E)^n$.

End of year	Price at year n	Present value of P_n
1	\$24.27	\$22.48
2	\$25.73	\$22.06
3	\$27.27	\$21.65
4	\$28.91	\$21.25
5	\$30.65	\$20.86
10	\$41.01	\$19.00
20	\$73.44	\$15.76
50	\$421.82	\$8.99
100	\$7,770.02	\$3.53

- b) The price today at different growth rates is as follows:

Growth rate	Price today, P_0
5.50%	\$18.32
5.75%	\$20.36
6.25%	\$26.17
6.50%	\$30.53