FINA 0025 –Financial Management
Valuation of Equity Securities
Tutorial Solutions for Lecture 3

Note that detailed answers to tutorial questions will only be provided in tutorials. The following abridged answers are intended as a guide to these 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 or the lecturer.

A. Short Answer Questions
A1. See lecture notes for definition of price-earnings ratio
a) A rise in g implies that the P/E ratio would rise
b) A fall in the retention rate implies the P/E ratio will rise
c) A fall in the earnings per share would result in the P/E ratio rising

A2.
a) False. The model is ideally suited for valuing firms that have a history of paying a regular dividend.
b) False. In this model g refers to the growth rate of *future* dividends.
c) False. In the model $(k_e - g)$ must be greater than zero.

B. Problems
B1.
a) $D_1 = \$1.26$ $P_0 = \$18.00$

b) $D_1 = \$1.08$ $D_2 = \$0.972$ $D_3 = \$0.8748$ $D_4 = \$0.9185$ $P_3 = \$13.124$ $P_0 = \$11.70$

c) Clearly, the value of the underlying stock derived under a dividend discount framework is extremely sensitive to the growth rate variable.

B2.
a)

Time	0	1	2	3	4	...
EPS	20,00	22,00	24,20	26,62	27,95	
Dividends	12,00	13,20	14,52	15,97	16,77	

$P_0 = 13.20/(1+11\%) + 14.52/(1+11\%)^2 + 15.97/(1+11\%)^3 + [(15.97\times 1.05)/(11\%-5\%)]/(1+11\%)^3 = 239.73$

b)

Time	0	1	2	3	4	...
EPS	20,00	27,00	29,20	31,62	33,36	
Dividends	12,00	0,00	17,52	18,97	20,02	

$P_0 = 17.52/(1+11\%)^2 + 18.97/(1+11\%)^3 + [(18.97*1.055)/(11\%-5.5\%)]/(1+11\%)^3 =$
$=239.73$

c) I would support the new investment opportunity as it will increase the shareholders wealth.

d)

- The announcement date of dividends: the impact on price depends on the relation between the expected dividend and the announced one (the price will increase if the announced dividend is higher than expected and will decrease if it is lower).
- The ex-dividend date: the price will decrease by an amount equal/close to the dividend paid.
- The payment date of the dividends: nothing is expected to occur.

B3.
Note: The question assumes that the firm keeps its payout ratio constant at 25% during the high-growth phase; the payout ratio is 60%, starting in 2010.

a)
Cost of Equity = 15%

Year	Earnings	Dividend	PV Dividend	Retained Earnings	Payout Ratio
2008	2.000.000,00	500.000,00		1.500.000,00	25%
2009	3.000.000,00	750.000,00	652.173,91	2.250.000,00	25%
2010	4.500.000,00	1.125.000,00	850.661,63	3.375.000,00	25%
2011	6.750.000,00	4.050.000,00	2.662.940,74	2.700.000,00	60%
			4.165.776,28		

The Present Value of the dividends through 2011 is $4.165.776,28.
Dividends after that date will grow at 8% per year.

2011 present value of future dividends: $\dfrac{D_{2011} \times (1+g)}{r-g}$

This value needs to be brought back to December 2008terms. Remember that you have to discount over 3 years (end of 2008 to end of 2011)

2011 present value = $\dfrac{4.050.000,00 \times 1.08}{0.15-0.08} = \$62.485.714,29$

Present Value = $\dfrac{62.485.714,29}{(1.15)^3} = \$41.085.371,44$

The value of the firm is equal to this value plus the value of the first three years.

Value of the firm = $41.085.371,44 + $4.165.776,28 = **$45.251.147,72**

b)
If the cost of equity during the start-up years is 20%, then the value is:

Year	Earnings	Dividend	PV Dividend	Retained Earnings	Payout Ratio
2008	2.000.000,00	500.000,00		1.500.000,00	25%
2009	3.000.000,00	750.000,00	625.000,00	2.250.000,00	25%
2010	4.500.000,00	1.125.000,00	781.250,00	3.375.000,00	25%
2011	6.750.000,00	4.050.000,00	2.343.750,00	2.700.000,00	60%
			3.750.000,00		

The present value of future dividends after 2011 is unchanged. However, you still have to use the higher discount factor of 20% to discount back from the end of 2008 to the end of 2011.

$$2011 \text{ present value} = \frac{4.050.000,00 \times 1.08}{0.15 - 0.08} = \$62.485.714,29$$

$$\text{Present Value} = \frac{62.485.714,29}{(1.20)^3} = \$36.160.714,29$$

Value of the firm = $36.160.714,29 + $3.750.000,00 = **$39.910.714,29**
Hence, the value of the firm drops by:

$$\frac{\$39.910.714,29}{\$45.251.147,72} - 1 = -11.80\%$$

c)
Cost of Equity = 15%

Year	Earnings	Dividend	PV Dividend	Retained Earnings	Payout Ratio
2008	2.000.000,00	500.000,00		1.500.000,00	25%
2009	3.200.000,00	800.000,00	695.652,17	2.400.000,00	25%
2010	4.800.000,00	1.200.000,00	907.372,40	3.600.000,00	25%
2011	7.200.000,00	4.320.000,00	22.840.470,12	2.880.000,00	60%
			4.443.494,70		

$$2011 \text{ present value} = \frac{4.320.000,00 \times 1.08}{0.15 - 0.08} = \$66.651.428,57$$

$$\text{Present Value} = \frac{66.651.428,57}{(1.20)^3} = \$43.824.396,20$$

Value of the firm/Invest dividend = $43.824.396,20 + $4.443.494,70 = **$48.267.890,90**
Value of the firm/Not Invest dividend = $45.251.147,72+ $500.000,00 = **$45.751.147,72**

Difference = $48.267.890,90 – $45.751.147,72 = **$2.516.743,18**
The difference is positive $2.52 million, hence the gain is positive. The firm is worth much more if the early dividends are reinvested.

B4.
Choice **"a"** is correct. The return is calculated as follows:

$$P_{CS} = \frac{DIV_n + P_{CS_n}}{(1 + r_{CE})^n} \Leftrightarrow \$32 = \frac{\$1.00 + \$38}{1 + r} \Leftrightarrow r = \frac{\$39}{\$32} - 1 = 21.88\%$$

Remember to add in the projected dividend to the numerator of the calculation.
Choice **"b"** is incorrect. This is the result if the existing dividend of $0.94 is used in the calculations. But, the correct dividend to use is the expected dividend of $1.00.
Choice **"c"** is incorrect. This is the result if the dividend is incorrectly ignored in the calculation.
Choice **"d"** is incorrect. This is the result if the expected dividend is subtracted instead of added.