

Midterm Exam Answer

Financial Management (1514 & 1515, Fall 2015)

National Chiao Tung University

Part I (50 points; 2 points each)

1.	A
2.	C
3.	D
4.	D
5.	D
6.	C
7.	D
8.	D
9.	B
10.	B
11.	A
12.	C
13.	C
14.	A
15.	B
16.	E
17.	B
18.	E
19.	E
20.	B
21.	E
22.	A
23.	E
24.	A
25.	C

Part II (50 points)

1. (5 points)

$$0.18 \times \$60,000 = (0.15 \times \$50,000) + (x \times (\$60,000 - 50,000))$$

$$\$10,800 = \$7,500 + \$10,000x$$

$$x = 0.33 \text{ (or 33\%)}$$

2. (20 points, 5 points each)

(A)

Last year:

$$\text{ROE} = \text{leverage ratio} \times \text{asset turnover} \times \text{profit margin}$$

$$0.15 = \text{leverage ratio} \times 1.25 \times 0.08$$

$$\text{Leverage ratio} = 1.5$$

This year:

$$\text{ROE} = \text{leverage ratio} \times \text{asset turnover} \times \text{profit margin}$$

$$0.20 = \text{leverage ratio} \times 1.25 \times 0.08$$

$$\text{Leverage ratio} = 2$$

$$\text{Percentage increase} = (2 - 1.5)/1.5 = .3333, \text{ or } 33.33\%$$

(B)

$$\text{Times interest earned} = \text{EBIT}/\text{Interest}$$

$$2 = \text{EBIT}/\$1,500,000; \text{EBIT} = \$3,000,000$$

$$\text{Net income} = \text{EBIT} - \text{interest} - \text{taxes}$$

$$\text{Net income} = \$3,000,000 - 1,500,000 - 1,000,000 = \$500,000$$

$$\text{ROE} = \text{Net income} / \text{Equity}$$

$$\text{ROE} = \$500,000/\$1,500,000$$

$$\text{ROE} = 0.3333, \text{ or } 33.33\%$$

(C)

$$\text{EBIT} = \text{revenues} - \text{COGS} - \text{depreciation} = \$3,000,000 - 2,500,000 - 200,000$$

$$\text{EBIT} = \$300,000$$

$$\text{Interest payments} = .08 \times \$1,000,000 = \$80,000$$

$$\text{Times interest earned} = \text{EBIT} / \text{interest payments}$$

$$\text{Times interest earned} = \$300,000 / \$80,000$$

$$\text{Times interest earned} = 3.75$$

(D)

$$\text{P/E} = \$20 / \$2 = 10$$

$$\begin{aligned} \text{Market-to-book} &= \frac{\$20}{\left(\frac{\$600,000}{50,000 \text{ shares}} \right)} \\ &= \$20 / \$12 \\ &= 1.67 \end{aligned}$$

3. (6 points)

The degree of sustainable growth can be measured by the sustainable growth ratio which is based on below equation:

$$\text{Sustainable growth rate} = \text{Plowback ratio} \times \text{ROE} = \frac{\text{Retained Earnings}}{\text{Earnings}} \times \text{ROE}$$

We know that ROE is determined by leverage ratio, asset turnover, and operation profit margin. Therefore, the 4 factors that affect the degree of sustainable growth are (1) ratio of earnings that are retained, (2) leverage ratio, (3) asset turnover, and (4) profit margin.

When more earnings are retained, more debt is used, faster asset turnover, and higher profit margin, the higher the sustainable growth rate is expected for a firm.

4. (7 points)

$$\$150,000 = \text{PMT}([1/(\.0565/12)] - 1/\{(\.0565/12)[1 + (\.0565/12)]^{30 \times 12}\})$$

$$\text{PMT} = \frac{\text{PV} \cdot r}{1 - (1 + r)^{-t}} = \frac{150000 \cdot \frac{0.0565}{12}}{1 - \frac{1}{\left(1 + \frac{0.0565}{12}\right)^{30 \cdot 12}}} = \$865.85$$

$$\$150,000 = \text{PMT}([1/(\.049/12)] - 1/\{(\.049/12)[1 + (\.049/12)]^{15 \times 12}\})$$

$$\text{PMT} = \frac{\text{PV} \cdot r}{1 - (1 + r)^{-t}} = \frac{150000 \cdot \frac{0.049}{12}}{1 - \frac{1}{\left(1 + \frac{0.049}{12}\right)^{15 \cdot 12}}} = \$1,178.39$$

$$\text{Total difference} = (\$865.85 \times 12 \times 30) - (\$1,178.39 \times 12 \times 15) = \$99,595.80$$

5. (5 points)

$$\text{Price} = (.06 \times \$1,000) \{ (1/.075) - [1/.075(1.075)^{10}] \} + \$1,000/1.075^{10} \text{ or}$$

$$\text{Price} = \text{Coupon} \cdot \left[\frac{1 - \frac{1}{(1+r)^t}}{r} \right] + \frac{\text{Par}}{(1+r)^t} = 60 \cdot \left[\frac{1 - \frac{1}{1.075^{10}}}{0.075} \right] + \frac{1000}{1.075^{10}}$$

$$\text{Price} = \$897.04$$

6. (7 points)

$$\text{Current yield: Coupon / Price} = \$80/\$1,100 = 0.0727 = 7.27\%$$

Approximated yield to maturity (YTM):

$$\text{YTM} = \frac{\text{Coupon} + \frac{\text{Face} - \text{PV}}{t}}{\frac{\text{Face} + \text{PV}}{2}} = \frac{80 + \frac{1000 - 1100}{8}}{\frac{1000 + 1100}{2}} = 0.06428571 = 6.43\%$$

$$(\$1,100 = \$80 \times \left[\frac{1}{r} - \frac{1}{r \times (1+r)^8} \right] + \frac{\$1,000}{(1+r)^8} \Rightarrow r = 6.3662\%)$$