

Concordia University
John Molson School of Business
Financial Management-MBA 614
Sample Exam

Problem 1:

Assume today is your 25th birthday. Starting today, you plan to deposit \$2,000 into a bank account on each birthday with the last deposit made on your 60th birthday. If the bank account pays an interest rate of 9% compounded quarterly, compute:

- (a) the amount you will have on your 60th birthday?
- (b) the equal amount that you will be able to spend each year during your retirement over a 20 year period starting from your 61st birthday?
- (c) How would your answer to (b) change if you are told that you will not deposit anything into the account on your 36th, 37th, 38th, 39th and 40th birthdays?

Compute the EAR first.

$$EAR = 9.31\%$$

(a) Compute FV at age 60 as:

$$PMT = 2000 \quad N=36 \quad I=9.31\% \quad PV = 0 \quad \text{Compute FV} = \$507,981.82$$

Remember, you can also compute this by first computing the FV of the deposits from age 26 to 60 (35deposits) and the FV of the first deposit today.

$$(i) \quad PV = 0 \quad I = 9.31\% \quad N = 35 \quad PMT = 2000 \quad FV = \$462,887.04$$

$$(ii) \quad FV \text{ of the first deposit} = 2000(1.0931)^{35} = \$45,094.78$$

$$FV = 462,887.04 + 45,094.78 = \$507,981.82$$

(b) You will be withdrawing the money for 20 years

$$PV = -507981.82 \quad N=20 \quad I=9.31\% \quad FV = 0$$

$$\text{Compute PMT} = \$56,882.23$$

(c) Value of lost deposits at age 40:

$$PMT = 2000 \quad N=5 \quad I=9.31\% \quad PV=0 \quad \text{Compute FV}_{40} = \$12,043.57$$

Value of these lost deposits at age 60:

$$FV_{60} = 12,043.57(1.0931)^{20} = \$71,441.93$$

$$\text{Amount available at age 60 now} = 507981.82 - 71,441.93 = \$436,539.89$$

Amount that can be spent each year for 20 years now is:

$$PV = -436,539.89 \quad N=20 \quad I=9.31\% \quad FV = 0$$

$$\text{Compute PMT} = \$48,882.38$$

VIP Corporation has just paid a dividend of \$1.50. Dividends are expected to grow at 20% for the first three years, 10% for the following two years. What is the expected growth rate for the subsequent years if the stock is selling for \$24.86 today and the required return is 17 percent?

(Hint: g is only used to calculate the price at year 5: $P_5 = \frac{D_5(1+g)}{R-g}$)

$$PV(D_{1-5}) = \frac{\$1.5*(1.20)}{(1.17)^1} + \frac{\$1.5*(1.20)^2}{(1.17)^2} + \frac{\$1.5*(1.20)^3}{(1.17)^3} + \frac{\$1.5*(1.20)^3*(1.10)}{(1.17)^4} + \frac{\$1.5*(1.20)^3*(1.10)^2}{(1.17)^5} = \$7.69$$

$$P_5 = (24.86 - 7.68679) * 1.17^5 = 37.651364, \text{ then}$$

$$37.65136431 = \frac{1.5 * 1.2^3 * 1.1^2 * (1+g)}{.17 - g}$$

$$6.40 - 37.65g = 3.1363 + 3.1363g$$

$$3.2637 = 40.7863g$$

$$g = 8\%$$

Problem 2:

Macaroni, Inc. announced that it would pay the following dividends over the next five years: \$0.50, \$0.75, \$1.50, \$3, and \$4. Afterwards, dividends will increase at a rate of 3 percent per year indefinitely. What is the firm's current stock price if the required rate of return is 13%?

$$P = \frac{0.5}{1.13} + \frac{0.75}{1.13^2} + \frac{1.5}{1.13^3} + \frac{3}{1.13^4} + \frac{4}{1.13^5} + \frac{4(1.03)}{1.13^5 / (13\% - 3\%)} = 28.44$$