

THE HONG KONG POLYTECHNIC UNIVERSITY
HONG KONG COMMUNITY COLLEGE

Subject Title : Financial Management

Subject Code : CCN2113

Session : Semester Two, 2017/18

Numerical Answers

Question B1

(a) $E(R) = r_f + \beta \times (R_m - R_f) = 2\% + 1.6 \times (12\% - 2\%) = 18\%$

(b) $P_2 = \frac{D_3}{r - g} = \frac{\$5}{18\% - 6\%} = \$41.67$

(c) $P_0 = \frac{P_2}{(1 + r)^2} = \frac{\$41.67}{1.18^2} = \$29.92$

(d) $P_7 = \frac{D_8}{r - g} = \frac{\$5 \times (1 + 6\%)^5}{18\% - 6\%} = \55.76

(e) First, find the portfolio beta:

$$E(R_p) = R_f + \beta_p \times (R_m - R_f)$$
$$11\% = 2\% + \beta_p \times (12\% - 2\%)$$
$$\beta_p = 0.9$$

From portfolio beta equation:

$$\beta_p = w_{Robert} \beta_{Robert} + w_{IMGG} \beta_{IMGG}$$
$$\beta_p = w_{Robert} \beta_{Robert} + (1 - w_{Robert}) \beta_{IMGG}$$
$$0.9 = 1.6w_{Robert} + 0.6(1 - w_{Robert})$$
$$w_{Robert} = 0.3$$
$$w_{IMGG} = 0.7$$

Thus, you should invest

Robert APP: $\$100,000 \times w_{Robert} = \$100,000 \times 0.3 = \$30,000$

IMGG: $\$100,000 \times w_{IMGG} = \$100,000 \times 0.7 = \$70,000$

(No step mark will be granted)

(No mark will be granted for any unclear answer.)

Question B2

(b) Bond A:

$$P_A = \$90 \times \frac{1 - \frac{1}{(1 + 7\%)^6}}{7\%} + \frac{\$1000}{(1 + 7\%)^6} = \$1,095.33$$

Bond B:

$$P_B = \$60 \times \frac{1 - \frac{1}{(1 + 7\%)^6}}{7\%} + \frac{\$1000}{(1 + 7\%)^6} = \$952.33$$

(c) Bond A:

$$P_A = \$90 \times \frac{1 - \frac{1}{(1 + 9\%)^4}}{9\%} + \frac{\$1000}{(1 + 9\%)^4} = \$1,000$$

Bond B:

$$P_B = \$60 \times \frac{1 - \frac{1}{(1 + 9\%)^4}}{9\%} + \frac{\$1000}{(1 + 9\%)^4} = \$902.81$$

Question B3

(a)	Sales	\$1,210,000
	-Cost of goods sold	172,000
	-Other Expenses	14,000
	-Depreciation	40,000
	EBIT	\$984,000
	-Interest	80,000
	Taxable income	\$904,000
	-Taxes (\$904,000x30%)	271,200
	Net income	\$632,800

(b) CF to creditors = Interest paid – Net new borrowing
CF to creditors = \$80,000 – (-\$30,000) = \$110,000

CF to stockholders = Dividends paid – Net new equity
CF to stockholders = \$63,280 - \$20,000 = \$43,280

CFFA = CFCR + CFSH = \$110,000 + \$43,280 = \$153,280

(c) payout ratio = DIV/Ni = \$63,280/\$632,800 = 10%

(d) ROE = NI / TE
= \$632,800 / \$4,520,000 = 14%

(e) $g = \frac{ROE \times b}{1 - ROE \times b} = \frac{14\% \times (1 - 10\%)}{1 - 14\% \times (1 - 10\%)} = 14.42\%$

Question B4

(a) Book value of Equity: $\$8 \times 50,000,000 = \$400,000,000$
Book value of Bond: $\$1,000 \times 100,000 = \$100,000,000$
Total value of Firm = \$40,000,000+\$100,000,000=\$500,000,000

$$W_E = \frac{40}{50} = 80\%$$

$$W_D = \frac{10}{50} = 20\%$$

- (b) Market value of Equity: $\$9.52 \times 50,000,000 = \$476,000,000$
 Market value of Bond: $\$1,000 \times 100,000 \times 0.84 = \$84,000,000$
 Total value of Firm = $\$476,000,000 + \$84,000,000 = \$560,000,000$
- $$W_E = \frac{476}{560} = 85\%$$
- $$W_D = \frac{84}{560} = 15\%$$
- (c) $R_{WACC} = W_E R_E + W_D R_D (1 - T) = 0.85 \times 14\% + 0.15 \times 8.4\% \times (1 - 0.4)$
 $R_{WACC} = 12.66\%$
- (d)(i) $P = \frac{\$6}{0.08} = \75
- (d)(ii) The number of preferred stock the company needed to issue is:
 $\frac{\$600,000}{\$75} = 8,000$

Question B5

- (a) The monthly return is:

$$r = \frac{\$2,000}{\$250,000} = 0.8\%$$

$$\text{APR} = r \times 12 = 9.6\%$$

$$\text{EAR} = (1 + 0.8\%)^{12} - 1 = 10.03\%$$

- (b) We should compare the EARs of the two banks

Bank A's EAR:

$$\text{EAR}_A = \left(1 + \frac{12\%}{12}\right)^{12} - 1 = 12.68\%$$

Bank B's EAR:

$$\text{EAR}_B = \left(1 + \frac{12.2\%}{2}\right)^2 - 1 = 12.57\%$$

As Bank B's EAR < Bank A's EAR (12.57% < 12.68%)

We should take the loan offer at Bank B.

- (c) The dividend payment is an annuity:

$$P = \$10 \times \frac{1 - \frac{1}{(1 + 5\%)^8}}{5\%}$$

$$P = \$64.63$$

Question B6

$$(a) \quad NPV_A = -25,000 + 6,000/1.15 + 22,000/1.15^2 + 8,000/1.15^3 \\ = \$2,112.68$$

$$NPV_B = -18,000 + 5,000/1.15 + 11,000/1.15^2 + 9,000/1.15^3 \\ = \$583.05$$

$$(b) \quad PI_A = (6,000/1.15 + 22,000/1.15^2 + 8,000/1.15^3) / \$25,000 \\ = 1.08$$

$$PI_B = (5,000/1.15 + 11,000/1.15^2 + 9,000/1.15^3) / \$18,000 \\ = 1.03$$

$$(c) \quad \text{Payback period A} = 1 + 19/22 = 1.86 \text{ years} \\ \text{Payback period B} = 2 + 2/9 = 2.22 \text{ years}$$