THE HONG KONG POLYTECHNIC UNIVERSITY
HONG KONG COMMUNITY COLLEGE

Subject Title : Principles of Investments **Subject Code** : CCN2132

Session : Semester One, 2017/18

Numerical Answers

Question B1

(c) $2.22 x 600 + $2.23 x 500 + $2.26 x 100 = $2,673

Question B3

(a) $\frac{60}{7.5\%}\left[1-\frac{1}{(1+7.5\%/2)^{10}}\right]+\frac{1,000}{(1+7.5\%/2)^{10}}=\$938.4$

(b) $\frac{60}{6.8\%}\left[1-\frac{1}{(1+6.8\%/2)^{9}}\right]+\frac{1,000}{(1+6.8\%/2)^{9}}=\$969.43$

Holding period return = $\frac{(\$969.43-\$938.4)+\$1,000x6\%x0.5}{\$938.4}\times 100\% = 6.5\%$

Question B4

(a) $[(1+8.5\%) \times (1+12.5\%) \times (1-6.6\%)]^{1/3} - 1 = 4.47\%$

(b) Fund value at the end of 2016
= [$100,000 x (1+8.5%) x (1+12.5%) - $50,000] x (1-6.6%) = $67,306.38

Formula for calculating average annual return

$0 = -\$100,000 + \frac{50,000}{(1+R)^2} + \frac{67,306.38}{(1+R)^3}$

Question B5

(a) ($183 mil. - $10 mil.) /6mil. = $28.83

Premium to NAV = ($30 - $28.83)/$28.83 x 100% = 4.05%

(b) $0.95 \times (1 + R_A - 1\%)^5 = (1 + 8\% - 2.5\%)^5$

$R_A = 7.59\%$

Question B6

(b) Reward-to-risk ratio of Stock P = (13% - 2%)/1.3 = 8.46

Reward-to-risk ratio of Stock Q = (11% - 2%)/0.9 = 10

Yanny should choose Stock Q.

(c) $[E(R_P) - 2\%]/1.3 = 10$
$E(R_P) = 15\%$

Question C1

(a)(i) D_1 = \$200 million x 30% x (1+20%) / 400 million = \$0.18
D_2 = \$0.18 x (1+12.5%) = \$0.2025
D_3 = \$0.2025 x (1+5%) = \$0.212625

(a)(ii) Discount rate = 2.5% + 1.2 x 5% = 8.5%

(a)(iii) Justified share price

$$= \frac{\$0.18}{(1+8.5\%)} + \frac{\$0.2025}{(1+8.5\%)^2} + \frac{\$0.212625}{8.5\%-5\%} \times \frac{1}{(1+8.5\%)^2} = \$5.50$$

(b) Enterprise value = \$692 million x 6 =\$4,152 million

Equity Value = (\$4,152 + \$350 - \$1,789) million = \$2,713 million

Justified share price = \$2,713 million / 400 million = \$6.78

Question C2

(b) Expected return of Portfolio GH: $\frac{\$900,000}{\$1,200,000}$ x 13% + $\frac{\$300,000}{\$1,200,000}$ x 15%
= 13.5%
Standard deviation of Portfolio X:
$[(0.75)^2(0.15)^2 + (0.25)^2(0.18)^2 + 2(0.75)(0.25)(0.15)(0.18)(0.38)]^{0.5}$
= 13.61%

(c) Standard deviation of Portfolio FGH = $\frac{\$1,200,000}{\$2,000,000}$ x 13.61% = 8.17%

(d) Let W_x be weighting of Stock X in the minimum variance portfolio:

$$W_x = \frac{(0.15)^2-(0.15)(0.08)(-1)}{(0.08)^2+(0.15)^2-2(0.15)(0.08)(-1)} = 0.6522$$

W_G = 1- 0.6522 = 0.3478

Standard deviation of minimum variance portfolio:
$[(0.6522)^2(0.08)^2 + (0.3478)^2(0.15)^2 + 2(0.6522)(0.3478)(0.08)(0.15)(-1)]^{0.5}$
= 0%

Question C3

(a) Maximum profit is found when the share price is \$80 at expiration.

Maximum profit = \$4 + \$2 = \$6

The option strategy is at breakeven point when the stock price is either larger than or smaller than \$80 at expiration.

If stock price is smaller than \$80, breakeven price of option strategy:
– (\$80 – S) + \$6 = 0, S = \$74

If stock price is larger than \$80, breakeven price of option strategy:
– (S – \$80) + \$6 = 0, S = \$86

(b)(i)

Balance sheet			
Cash	\$12,000	Owe 100 shares	\$8,000
		Account Equity	\$4,000

(b)(ii) Account Equity = \$12,000 – 100 x \$70 = \$5,000

Holding period percentage return = $\frac{\$5,000-\$4,000}{\$4,000} \times 100\% = 25\%$