THE HONG KONG POLYTECHNIC UNIVERSITY
HONG KONG COMMUNITY COLLEGE

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

Session : Semester Two, 2017/18

Numerical answers

Question B1

(b)(i) Accrued interest = \$1,000 x 6% x ½ x 45/182 = \$7.42

Invoice price = \$1,030 + \$7.42 = \$1,037.42

(b)(ii) Holding period percentage return = $\frac{\$1{,}028-\$1{,}037.42+\$1{,}000\times 6\%\times 0.5}{\$1{,}037.42} \times 100\%$

= 1.98%

Question B3

(a) Index value on Day 0 = $\frac{20.5+3+0.5}{3}$ = 8

Index value at the beginning of Day 1 = $\frac{20.5+1.5+0.5}{d}$ = 8

d = 2.8125

(b) $\frac{21+1.5+0.562}{2.8125}$ = 8.1998

Percentage change of Index value = $\frac{8.1998-8}{8} \times 100\% = 2.50\%$

(c) Stock Q has the highest weighting. The larger market capitalization of stock has highest weighting in value-weighted index.

Stock Q has the larger market capitalization (e.g. \$300,000 on Day 1) than Stock P (\$21,000 on Day 1) and Stock R (\$28,100 on Day 1).

Question B4

(a)(i) $12\% \times (1-\frac{\$1.8}{\$4.5})$ = 7.2%

(a)(ii) 2.5% + 0.8 x 7% = 8.1%

(a)(iii) $\frac{\$1.8}{8.1\%-7.2\%}$ = \$200

Question B5

(a) Purchase price = \$10,000 x [1 – 2.3% x (95/360)] = \$9,939.31

Bond Equivalent Yield = $\frac{365\times 2.3\%}{360-95\times 2.3\%}$ = 2.35%

(b) 1-year forward rate one year from now = $\frac{(1+5.5\%)^2}{(1+4\%)} - 1 = 7.02\%$

2-year forward rate two year from now = $[\frac{(1+7.8\%)^4}{(1+5.5\%)^2}]^{0.5} - 1 = 10.15\%$

Question B6

(a)

	\$		**\$**
Stock value	80,000	Margin loan	40,000
		Account Equity	40,000

(b) Loan amount = \$40,000 $(1+\frac{8\%}{12})^4$ = \$41,077.38

Account Equity = \$45 x 2,000 - \$41,077.38 = \$48,922.62

Holding period percentage return = $\frac{\$48,922.62-\$40,000}{\$40,000} \times 100\%$

= 22.31%

Annual percentage return = 22.31% x $\frac{12}{4}$ = 66.92%

Question C1

(c) Expected return = 12% x 0.7 + 9% x 0.3 = 11.1%

Expected risk premium = 11.1% - 3% = 8.1%

Standard deviation
$= [(0.7)^2(0.13)^2 + (0.3)^2(0.1)^2 + 2(0.7)(0.13)(0.3)(0.1)(0.68)]^{0.5}$
= 11.3551%

(d)(i) Let w be weighting of Portfolio EG in Portfolio AEG:

w (0.111) + (1-w)(0.03) = 0.15
w = 1.4815
Dollar amount invested in EG = \$2,000,000 x 1.4815 = \$2,963,000
Dollar amount borrowed from risk-free assets = \$963,000

(d)(ii) Standard deviation = 1.4815 x 11.3551% = 16.82%

Question C2

(b) Reward-to-risk ratio of market portfolio = $\frac{12.5\%-2.5\%}{1} = 10\%$

Reward-to-risk ratio of Raymond's portfolio = $\frac{13\%-2.5\%}{1.05} = 10\%$

As reward-to-risk ratio of Raymond's portfolio was the same as that of market portfolio, Raymond's portfolio was correctly priced.

(d)(i) Expected return of Stock A = 2.5% + 0.9 x (12.5% - 2.5%) = 11.5%

Unexpected return = 13% - 11.5% = 1.5%

Systematic portion of unexpected return = 0.9 x (11% - 12.5%) = -1.35%

Unsystematic portion of unexpected return = 1.5% - (-1.35%) = 2.85%

Question C3

(a) -\$7+\$4x2 -\$2 = -\$1

(b)

Share price at expiration	Payoff of Call No. 1 position	Payoff of Call No. 2 position	Payoff of Call No. 3 position	Net profit of Total position
\$45	**\$0**	**\$0**	**\$0**	**-\$1**
\$50	**\$0**	**\$0**	**\$0**	**-\$1**
\$55	**+\$5**	**\$0**	**\$0**	**+\$4**
\$60	**+\$10**	**-\$10**	**\$0**	**-\$1**
\$65	**+\$15**	**-\$20**	**+\$5**	**-\$1**

(c)(i) Long a straddle.

Buy Call No. 2 and Put No. 1 with the same amount

(c)(ii) Maximum profit: unlimited

Breakeven price:
When the price is below \$55:
(\$55-S) - \$6 = 0; S=\$49

When the price is above \$55:
(S-\$55) - \$6 = \$0; S=\$61