Student ID.....

EE431 Economics of Financial Markets and Institutions

Exercise 4: Capital Asset Pricing Model (CAPM), Hint and Correction

Correction :

Question 2 : Company X has a beta of 1.45. The expected risk-free rate of interest is 2.5% amd the expected return on the market as a whole is 10%. Using the CAPM, what is **Stock X**'s expected return?

Question 3 C : What is the beta of stock A?

Hint: By definition, $\beta_A = \dfrac{r_{A,m}\sigma_A\sigma_m}{\sigma_m^2} = \dfrac{COV(R_A, R_m)}{\sigma_m^2}$.

Find $COV(R_A, R_m)$.

$$\begin{aligned} COV(R_A, R_m) &= E([(R_A - E(R_A)(R_m - E(R_m))] \\ &= E([(R_A - E(R_A)(w_A R_A + w_B R_B - w_A E R_A - w_B E R_B)] \\ &= E([(R_A - E(R_A)\left\{(w_A R_A - w_A E R_A) + (w_B R_B - w_B E R_B)\right\}] \\ &= E\left[w_A(R_A - E(R_A)^2 + w_B(R_A - E R_A)(R_B - E R_B)\right] \\ &= w_A\sigma_A^2 + w_B COV(R_A, R_B) \\ &= w_A\sigma_A^2 + w_B r_{AB}\sigma_A\sigma_B \end{aligned}$$

After this calculation, you can find the beta of stock A.

Note : We may realize that given all the statistical data of stock A and stock B. We can find covariance between return on stock A with any portfolio comprising stock A and stock B.