University of Texas at Austin

Quiz #18

CAPM consequences.

Please, provide your **complete solutions** to the following problems:

Problem 18.1. (5 points) For a certain stock, you are given that its expected return equals 0.12 and that its β equals 1.2. For another stock, you are given that its expected return equals 0.07 and that its β equals 0.4. Both stocks lie on the **Security Market Line (SML)**. What is the risk-free interest rate r_f?

Solution: Denote the expected return of the market portfolio by r_m. Then,

$$0.12 = r_f + 1.2(r_m - r_f),$$
$$0.07 = r_f + 0.4(r_m - r_f).$$

Subtracting the second equation from the first one, we get

$$0.05 = 0.8(r_m - r_f) \quad \Rightarrow \quad r_m - r_f = \frac{0.05}{0.8} = 0.0625.$$

Substituting the obtained risk premium of the market portfolio into the first equation above, we obtain

$$r_f = 0.12 - 1.2(0.0625) = 0.045.$$

Please, provide your *final answer only* to the following questions:

Problem 18.2. (2 points) We can use linear regression to estimate the *beta* of a stock. *True or false?*

Solution: TRUE

Problem 18.3. (2 points) Assume the assumptions of CAPM. Then, the **capital market line (CML)** is the tangent line of the feasible set going through the market portfolio. *True or false?*

Solution: TRUE

Problem 18.4. (2 points) The stocks **alpha** (α) measures the distance the stock's average return is away from the **security market line (SML)**. *True or false?*

Solution: TRUE

Problem 18.5. (2 points) The **beta** (β) of a portfolio is a weighted average of the betas of the individual components in the portoflio. *True or false?*

Solution: TRUE

Problem 18.6. (2 points) A portfolio is efficient if and only if the expected return of every available security equals the required returin of that security with respect to that porfolio. *True or false?*

Solution: TRUE