UNIVERSITY OF ESSEX DEPARTMENT OF ECONOMICS

EC371 Economic Analysis of Asset Prices

Multiple Choice Test

November 2011

- Time allowed: 40 minutes.
- There are TWENTY questions, ALL of which should be answered.
- ***DO NOT START UNTIL YOU ARE ASKED TO BEGIN.***
- Enter your name and registration number on the answer sheet.
- For each question, mark an **X** boldly through the **one** correct selection, A – D, on the answer sheet.
- Calculators (containing no textual information) are permitted.
- Only the answer sheet is to be returned. You should keep the question paper (this paper).
- The purpose of the test is solely formative for you to gauge your understanding of the course material. The mark will carry no weight in your overall result for the course.

1. An asset with market value at date t equal to \$80 will pay a dividend of \$7 at date $t+1$. Its market value (price) at $t+1$ will be \$77 (known with certainty).

   A. In the absence of arbitrage opportunities, the risk-free interest rate must equal 7%.

   B. The rate of return on the asset equals (80-77)/77 $\approx$ 3.9% (with no compounding from t to $t+1$).

   C. The rate of return on the asset equals 10% (with no compounding from t to $t+1$).

   D. The rate of return on the asset is 5% (with no compounding from t to $t+1$).

2. The payoff on an asset occurs with the following probabilities:

Payoff:	Probability:
\$16	0.6
\$6	0.4

   A. The expected payoff on the asset equals \$9.60.

   B. If the price of the asset is \$10 , its expected rate of return equals 20%.

   C. The expected payoff on the asset equals \$10.00.

   D. If the price of the asset is \$8, its expected rate of return equals 25%.

3. An asset will pay a dividend of \$25 at date $t+1$ at which date its price (market value) will be \$140, with certainty. The risk-free interest rate between t and $t+1$ equals 10%.

   A. In a frictionless market, and in the absence of arbitrage opportunities, the market value of the asset at date t equals \$150.

   B. In a frictionless market if the price of the asset is greater than \$150 at t, there is an arbitrage opportunity: use borrowed funds to purchase the asset at t, then sell it at $t+1$.

   C. In a frictionless market, and in the absence of arbitrage opportunities, the market value of the asset at date t equals \$126.

   D. In a frictionless market if the price of the asset is less than \$126 at t, there is an arbitrage opportunity: short-sell the asset at t, then re-purchase it at $t+1$.

4. An investor borrows 40 shares and short-sells them for \$10 each depositing an initial margin of 50%. The maintenance margin is 25%. The fee for borrowing the shares is zero. Transaction costs and interest on the margin account are zero.

   A. If the share price falls below \$8, there will be a margin call.

   B. If the share price rises to \$11, the investor will have gained \$40.

   C. If the share price rises above \$12, there will be a margin call.

   D. If the share price falls to \$6, the investor will have lost \$160.

5. There is evidence that stock market prices are more likely to fall on cloudy days than sunny days.

   A. This evidence proves that the stock market is 'weak form' ***in***efficient.

   B. This evidence proves that the stock market is 'semi-strong form' form ***in***efficient but may be 'weak form' efficient.

   C. The evidence proves that investors are irrational.

   D. If conventional wisdom is that asset price fluctuations shout not be affected by cloudiness, this is evidence of an anomaly in stock prices.

6. "... efficiency with respect to an information set, ϕ, implies that it is impossible to make economic profits by trading on the basis of ϕ." (*New Palgrave Dictionary of Money and Finance, 1992*)

   A. The statement is equivalent to 'weak form' efficiency for the given information set ϕ.

   B. It would be possible to assess whether any market is efficient only if a model is specified to provide a criterion to determine what constitutes 'economic profits'.

   C. If ϕ contains all publicly available information, then the market is 'strong form' efficient.

   D. An investor who has information in addition to ϕ, is sure to make economic profits.

7. On 21st September 2011, Omega plc announced a 2-for-1 split of its ordinary shares, upon which the share price fell from $74 (old shares) to $43 (new shares).

   A. The evidence from Omega's share-split shows that the market for its shares is weak form **in**efficient.

   B. The evidence from Omega's share-split shows that the market for its shares is semi-strong form **in**efficient.

   C. The information provided is, on its own, insufficient to determine whether the market for Omega's shares is informationally efficient.

   D. The evidence from Omega's share-split shows that the market for its shares is weak form efficient.

8. You are informed that the Fundamental Valuation Relationship (FVR) holds.

   A. The FVR implies that share prices follow a random walk.

   B. The FVR must hold for an investor who selects portfolios that satisfy maximisation of expected utility.

   C. The FVR implies that the asset price must equal the Net Present Value of its future stream of dividends.

   D. The FVR implies that the investor must have calculated the objective (true) probability for each possible state of the world.

9. An investor chooses a portfolio of just two risky assets, with $\mu_1 = 12\%$, $\sigma_1 = 0.08$, $\mu_2 = 8\%$, $\sigma_2 = 0.04$. The investor prefers more expected return relative to less, and prefers less risk (standard deviation) to more. [Notation: μ_j: expected rate of return on asset j; σ_j: standard deviation of return on asset j.]

   A. If 3/4 of initial wealth is invested in asset 1, and 1/4 in asset 2, the expected rate of return on the portfolio is 11% *irrespective of* the covariance between the returns.

   B. If 3/4 of initial wealth is invested in asset 1, and 1/4 in asset 2, the expected rate of return on the portfolio is 11% *only if* the covariance between the returns equals zero.

   C. If 3/4 of initial wealth is invested in asset 1, and 1/4 in asset 2, the variance of the rate of return on the portfolio is 0.07 *irrespective of* the covariance between the returns.

   D. If 3/4 of initial wealth is invested in asset 1, and 1/4 in asset 2, the variance of the rate of return on the portfolio is 0.07 *if* the covariance between the returns equals zero.

10. Assume that all investors choose portfolios from among 50 risky assets. *No risk-free asset is available.* All investors seek to maximize a mean-variance objective. They agree about the values of the means, variances and covariances (homogeneous beliefs) but may have different risk preferences.

   A. Every investor's optimum portfolio should contain the same proportion of each asset, i.e. $1/50 = 2\%$ of the portfolio should be allocated to each asset.

   B. Because investors have homogeneous beliefs, every investor will hold the same portfolio, namely the 'market portfolio'.

   C. Because investors have homogeneous beliefs, every investor will hold the same portfolio, namely the 'minimum risk portfolio' (the portfolio with minimum standard deviation among all the feasible portfolios).

   D. Every investor's optimum portfolio can be constructed from exactly two mutual funds (composite assets) each of which is formed from among the 50 assets.

11. An investor chooses a portfolio comprising a risk-free asset, yielding $r_0 = 1\%$, and a single risky asset with expected rate of return $\mu_Z = 5\%$, and standard deviation of return $\sigma_Z = 0.2$, to maximize the objective function, $\mu_P - \sigma_P^2$, where μ_P is the expected rate of return on the portfolio and σ_P^2 is the variance of the rate of return on the portfolio.

   A. The proportion of the portfolio invested in the *risk-free* asset equals 0.20.

   B. The proportion of the portfolio invested in the *risk-free* asset equals 0.80.

   C. The proportion of the portfolio invested in the *risky* asset and *risk-free* asset both equal 0.50.

   D. The proportion of the portfolio invested in the *risky* asset equals 0.40.

12. An investor chooses a portfolio that maximizes a mean-variance objective function. [Notation: r_0: risk-free interest rate; μ_j: expected rate of return on asset j; σ_j: standard deviation of return on asset j; μ_P: expected rate of return on any *efficient* portfolio P; σ_P: standard deviation of the rate of return on P; ρ_{jP}: correlation between the returns on assets j and P (covariance between j and P divided by the product of their standard deviations).]

    At the efficient portfolio P, the following condition holds for every asset, j:

    A. $(\mu_j - r_0)/\rho_{jP} = (\mu_P - r_0)/\sigma_P$ if $\rho_{jP} \neq 0$.

    B. $(\mu_j - r_0) = (\mu_P - r_0)\beta_{jP}$, where $\beta_{jP} = \rho_{jP}\sigma_j/\sigma_P$.

    C. $(\mu_j - r_0)/\sigma_j^2 = (\mu_P - r_0)/\sigma_P^2$.

    D. $(\mu_j - r_0)\rho_{jP}/\sigma_j = (\mu_P - r_0)/\sigma_P$.

13. Assume that all investors choose portfolios from among *a risk-free asset and 24 risky assets*. All investors seek to maximize a mean-variance objective. They agree about the values of the means, variances and covariances (homogeneous beliefs) but may have different risk preferences.

    A. Every investor's optimum portfolio must be constructed from the risk-free asset and a mutual fund which is the 'minimum risk portfolio' (the portfolio with the smallest standard deviation chosen from among all the portfolios consisting of risky assets only).

    B. The portfolio of every investor will be diversified so that the portfolio proportion of every asset is $1/25 = 4\%$ (i.e. the 24 risky assets and the risk-free asset).

    C. Every investor's optimum portfolio can be constructed from two mutual funds (composite assets) each of which consists entirely of risky assets.

    D. Every investor's optimum portfolio can be constructed from two mutual funds (composite assets) at least one of which includes the risk-free asset.

14. The expected rate of return on an asset, μ_j, equals 8%. Its standard deviation of return, σ_j, equals 0.30, and The standard deviation of the market return, σ_M, equals 0.5. The risk-free interest rate is 2%.

    A. The asset's *Sharpe ratio*, s_j, equals 0.2.

    B. The asset's *Sharpe ratio*, s_j, equals 0.12.

    C. The asset's *beta-coefficient*, β_j, equals 0.2.

    D. The asset's *beta-coefficient*, β_j, equals 0.12.

15. The expected rate of return on an asset, μ_j, equals 3%. Its standard deviation of return, σ_j, equals 0.20, while a benchmark portfolio used to calculate the *Risk Adjusted Performance*, RAP, has a standard deviation of return, σ_B, equal to 0.3. The risk-free interest rate is 1%.

    A. The asset's RAP equals 10%.

    B. The asset's RAP equals 8%.

    C. The asset's RAP equals 4%.

    D. The asset's RAP equals 2%.

16. You are informed that the beta-coefficient for asset A, β_A, exceeds that of asset B, β_B, i.e., $\beta_A > \beta_B$. In the Capital Asset Pricing Model (CAPM) this difference implies that:

    A. The standard deviation of asset A's return, σ_A, exceeds that for asset B, σ_B, i.e., $\sigma_A > \sigma_B$.

    B. The risk premium for asset A exceeds the risk premium for asset B (where an asset's risk premium is the difference between its expected rate of return and the risk-free interest rate).

    C. The 'Sharpe-ratio' of asset A exceeds the 'Sharpe-ratio' of asset B.

    D. The covariance of asset A's return with the market return, σ_{AM} is less than the covariance of asset B's return with the market return, σ_{BM}, i.e., $\sigma_{AM} < \sigma_{BM}$.

17. In the Capital Asset Pricing Model (CAPM) an asset's Characteristic Line (CL) expresses:

    A. The linear relationship between each asset's expected rate of return, μ_j, and its *beta-coefficient*, β_j.

    B. The linear relationship between the expected rate of return and standard deviation of return that holds for all mean-variance efficient portfolios (i.e., the set of mean-variance efficient portfolios in capital market equilibrium).

    C. The linear relationship between each asset's *beta-coefficient*, β_j, and its covariance with the market rate of return, σ_{jM}.

    D. The linear relationship between the risk premium on asset j, $(\mu_j - r_0)$, and the risk premium on the market portfolio, $(\mu_M - r_0)$.

18. The expected rate of return on an asset is given by $\mu_j = 4\%$, while for the market portfolio, $\mu_M = 3.50\%$. The asset's standard deviation of return is $\sigma_j = 0.3$, while for the market portfolio $\sigma_M = 0.2$. The correlation between the asset's return and the market return is: $\rho_{jM} = 0.80$. The risk-free interest rate is $r_0 = 1\%$.

    A. The given information is ***in***compatible with equilibrium in the Capital Asset Pricing Model (CAPM).

    B. Asset j's *beta-coefficient* equals 1.5.

    C. Asset j's *beta-coefficient* equals 1.2.

    D. The *Sharpe ratio* for asset j equals 0.12.

19. Asset A has expected rate of return equal to 7% and *beta-coefficient* equal to 1.2. Asset B has expected rate of return equal to 5% and *beta-coefficient* equal to 0.8.

    A. The information is compatible with CAPM equilibrium if the risk-free interest rate equals 1% and the expected return on the market portfolio equals 6%.

    B. The information is compatible with CAPM equilibrium if the risk-free interest rate equals 0.5% and the expected return on the market portfolio equals 5.5%.

    C. The information is compatible with CAPM equilibrium even when no risk-free asset exists, if expected return on the market portfolio equals 8% and the expected rate of return on a zero-beta portfolio equals 3%.

    D. The information given is ***in***compatible with CAPM equilibrium (either with or without a risk-free asset).

20. In CAPM equilibrium it is known that the expected rate of return on the market portfolio equals 6%, and the risk-free interest rate equals 2%. You are informed that the observed average rate of return on company Acme's shares equals 4%, with *beta-coefficient* equal to 1.5.

    A. Acme's shares are *undervalued* if the CAPM is an acceptable model.

    B. Acme's shares are *overvalued* if the CAPM is an acceptable model.

    C. The information given is compatible with CAPM equilibrium, i.e., it is what the CAPM predicts.

    D. The information given shows that there is an arbitrage opportunity: borrow funds at the risk free interest rate and invest in Acme's shares.

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