Reading 21

PORTFOLIO RISK & RETURN

1. (B) Total risk and the variance of returns.

Explanation

Variance is a measure of total risk.

(Module 21.1, LOS 21.c)

2. (B) may be concentrated in only a few stocks.

Explanation

According to the capital asset pricing model, in equilibrium all securities and portfolios plot on the SML. A security or portfolio is not priced in equilibrium if it plots above the SML (i.e., is undervalued) or below the SML (i.e., is overvalued).

(Module 21.2, LOS 21.f)

3. (C) are perfectly positively correlated with each other.

Explanation

The introduction of a risk-free asset changes the Markowitz efficient frontier into a straight line. This straight efficient frontier line is called the capital market line (CML). Since the line is straight, the math implies that the returns on any two portfolios on this line will be perfectly, positively correlated with each other. Note: When ra,b = 1, then the equation for risk changes to $s_{port} = W_A S_A + W_B S_B$, which is a straight line. The risky assets for each portfolio on the CML are the same, the tangency (or market) portfolio of risky assets. The CML includes lending portfolios with positive allocations to the risk-free asset, the market portfolio with no allocation to the risk-free asset, and borrowing portfolios with negative allocations to the risk-free asset.

(Module 21.1, LOS 21.b)

4. (C) beta.

Explanation

Beta for an individual security can be estimated by the slope of its characteristic line, a least-squares regression of the security's excess returns against the market's excess returns.

(Module 21.1, LOS 21.e)

5. (C) the market portfolio as his only risky asset.

Explanation

According to capital market theory, all investors will choose a combination of the market portfolio and borrowing or lending at the risk-free rate; that is, a portfolio on the CML.

(Module 21.1, LOS 21.a)

6. (B) 3.

Explanation

$24 = 6 + \beta (12 - 6)$

$18 = 6\beta$

$\beta = 3$

(Module 21.1, LOS 21.e)

7. (C) Standard deviation.

Explanation

In the context of the CML, the measure of risk (x-axis) is total risk, or standard deviation. Beta (systematic risk) is used to measure risk for the security market line (SML).

(Module 21.1, LOS 21.b)

8. (A) Systematic.

Explanation

The CAPM concludes that expected returns are a positive (linear) function of systematic risk**.**

(Module 21.1, LOS 21.c)

9. (B) all existing risky assets.

Explanation

The market portfolio has to contain all the stocks, bonds, and risky assets in existence. Because this portfolio has all risky assets in it, it represents the ultimate or completely diversified portfolio**.**

(Module 21.1, LOS 21.b)

10. (B) Total risk = systematic risk - unsystematic risk.

Explanation

Total risk = systematic risk + unsystematic risk

(Module 21.1, LOS 21.c)

11. (C) Yes, because it is undervalued.

Explanation

In the context of the SML, a security is underpriced if the required return is less than the holding period (or expected) return, is overpriced if the required return is greater the holding period (or expected) return, and is correctly priced if the required return equals the holding period (or expected) return.

Here, the holding period (or expected) return is calculated as: (ending price – beginning price + any cash flows/dividends) / beginning price. The required return uses the equation of the SML: risk free rate + Beta × (expected market rate − risk free rate).

ER = (26 – 20) / 20 = 0.30 or 30%, RR = 8 + (16 – 8) × 1.7 = 21.6%. The stock is under priced therefore purchase.

(Module 21.2, LOS 21.h)

12. (C) capital market line.

Explanation

The introduction of a risk-free asset changes the Markowitz efficient frontier into a straight line. This straight efficient frontier line is called the capital market line (CML). Investors at point Rf have 100% of their funds invested in the risk-free asset. Investors at point M have 100% of their funds invested in market portfolio M. Between Rf and M, investors hold both the risk-free asset and portfolio M. To the right of M, investors hold more than 100% of portfolio M. All investors have to do to get the risk and return combination that suits them is to simply vary the proportion of their investment in the risky portfolio M and the riskfree asset. Utility curves reflect individual preferences.

(Module 21.1, LOS 21.b)

13. (A) excess return per unit of risk.

Explanation

The Sharpe ratio measures excess return per unit of risk. Remember that the numerator of the Sharpe ratio is (portfolio return – risk free rate), hence the importance of excess return. Note that peakedness of a return distribution is measured by kurtosis.

(Module 21.2, LOS 21.i)

14. (A) 2.

Explanation

$24 = 8 + \beta (16 - 8)$

$24 = 8 + 8\beta$

$16 = 8\beta$

$16 / 8 = \beta$

$\beta = 2$

(Module 21.1, LOS 21.e)

15. (C) a straight line.

Explanation

The possible portfolios of a risky asset and a risk-free asset have a linear relationship between expected return and standard deviation.

(Module 21.1, LOS 21.a)

16. (A) there are no transactions costs or taxes.

Explanation

The CAPM assumes frictionless markets, i.e., no taxes or transactions costs. Among the other assumptions of the CAPM are that all investors have the same one-period time horizon and that all investments are infinitely divisible.

(Module 21.2, LOS 21.f)

17. (C) Sell Buy

Explanation

The required return for Mia Shoes is 0.08 + 0.9 × (0.15-0.08) = 14.3%. The forecast return is $2/$15 = 13.3%. The stock is overvalued and the investor should sell it. The required return for Video Systems is 0.08 - 0.3 × (0.15-0.08) = 5.9%. The forecast return is $2/$18 = 11.1%. The stock is undervalued and the investor should buy it.

(Module 21.2, LOS 21.h)

18. (A) The independent variable in the SML equation is the standard deviation of the market portfolio.

Explanation

The SML uses either the covariance between assets and the market or beta as the measure of risk. Beta is the covariance of a stock with the market divided by the variance of the market. Securities that plot above the SML are undervalued and securities that plot below the SML are overvalued.

(Module 21.2, LOS 21.h)

19. (B) Fund R.

Explanation

The Sharpe measure for a portfolio is calculated as the (mean portfolio return – mean return on the risk-free asset)/portfolio standard deviation. The Sharpe measures for the three mutual funds are:

mutual fund P = (13 − 5) / 18 = 0.44

mutual fund Q = (15 − 5) / 20 = 0.50

mutual fund R = (18 − 5) / 24 = 0.54

Assuming that investors prefer return and dislike risk, they should prefer portfolios with large Sharpe ratios to those with smaller ratios. Thus, the investor should prefer mutual fund R.

(Module 21.2, LOS 21.i)

20. (C) Jensen's alpha.

Explanation

Jensen's alpha is based on systematic risk and is not appropriate for a portfolio with a 50% concentration in a single entity (i.e., not well diversified). Both the Sharpe ratio and the Msquared measure are based on total portfolio risk and are appropriate for a portfolio that is not well diversified.

(Module 21.2, LOS 21.i)

21. (A) 10.2%.

Explanation

Use the capital asset pricing model (CAPM) to find the required rate of return. The approximate risk-free rate of interest is 5% (2% real risk-free rate + 3% inflation premium).

k = 5% + 1.3(4%) = 10.2%.

(Module 21.2, LOS 21.g)

22. (B) 16.6%.

Explanation

Using the security market line (SML) equation:

4% + 1.4(9%) = 16.6%.

(Module 21.2, LOS 21.g)

23. (C) the expected return for Portfolio Z is 14.8%.

Explanation

Portfolio Z has a beta of 1.3 and its required return can be calculated as 7.0% + 1.3 × (13.0% − 7.0%) = 14.8%. Because it plots on the SML, its expected (forecast) return and required return are equal.

The SML plots beta (systematic risk) versus expected equilibrium (required) return. The analyst believes that Portfolio Y is overvalued – any portfolio located below the SML has a forecast return less than its required return and is overpriced in the market. Since Portfolio X plots above the SML, it is undervalued and the statement should read, "Portfolio X's required return is less than its forecast return."

(Module 21.2, LOS 21.h)

24. (C) The variance of the resulting portfolio is a weighted average of the returns variances of the risk-free asset and of the portfolio of risky assets.

Explanation

This statement is not correct; the standard deviation of returns for the resulting portfolio is a weighted average of the returns standard deviation of the risk-free asset (zero) and the returns standard deviation of the risky-asset portfolio.

(Module 21.1, LOS 21.a)

25. (C) overvalued by 1.1%.

Explanation

To determine whether a stock is overvalued or undervalued, we need to compare the expected return (or holding period return) and the required return (from Capital Asset Pricing Model, or CAPM).

Step 1: Calculate Expected Return (Holding period return):

The formula for the (one-year) holding period return is:

$HPR = (D_1 + S_1 – S_0) / S_0$, where D = dividend and S = stock price.

Here, HPR = (0 + 55 – 45) / 45 = 22.2%

Step 2: Calculate Required Return:

The formula for the required return is from the CAPM:

$RR = R_f + (ER_M – R_f) \times Beta$

RR = 4.25% + (12.5 – 4.25%) × 2.31 = 23.3%.

Step 3: Determine over/under valuation:

The required return is greater than the expected return, so the security is overvalued.

The amount = 23.3% – 22.2% = 1.1%.

(Module 21.2, LOS 21.h)

26. (C) 13.5%.

Explanation

$k_i = Rf + \beta_i (R_M – Rf)$

$k = 6\% + 1.25(12\% – 6\%)$

$= 13.5\%$

(Module 21.2, LOS 21.g)

27. (A) a higher excess return per unit of risk.

Explanation

The Sharpe ratio is excess return (return – R_f) per unit of risk (defined as the standard deviation of returns).

(Module 21.2, LOS 21.i)

28. (B) see the same risk/return distribution for a given stock.

Explanation

All investors select portfolios that lie along the efficient frontier, based on their utility functions. All investors have the same one-period time horizon, and have the same risk/return expectations.

(Module 21.2, LOS 21.f)

29. (C) all investors who take on risk will hold the same risky-asset portfolio.

Explanation

One of the assumptions of the CAPM is that all investors who hold risky assets will hold the same portfolio of risky assets (the market portfolio). Risk aversion means an investor will accept more risk only if compensated with a higher expected return. In capital market theory, all investors exhibit risk aversion, even an investor who is short the risk-free asset. In the CAPM, a stock's risk is measured as its beta, not its standard deviation of returns.

(Module 21.2, LOS 21.f)

30. (A) is overvalued.

Explanation

Since the equation of the SML is the capital asset pricing model, you can determine if a stock is over- or underpriced graphically or mathematically. Your answers will always be the same. Graphically: If you plot a stock's expected return on the SML and it falls below the line, it indicates that the stock is currently overpriced, causing its expected return to be too low. If the plot is above the line, it indicates that the stock is underpriced. If the plot falls on the SML, it indicates the stock is properly priced. Mathematically: In the context of the SML, a security is underpriced if the required return is less than the holding period (or expected) return, is overpriced if the required return is greater the holding period (or expected) return, and is correctly priced if the required return equals the holding period (or expected) return.

(Module 21.2, LOS 21.h)

31. (C) 13.8%.

Explanation

$RR_{Stock} = R_f + (R_{Market} - R_f) \times Beta_{Stock}$, where RR= required return, R = return, and R_f =risk-free rate

Here, $RR_{Stock} = 6 + (12 - 6) \times 1.3 = 6 + 7.8 =$ **13.8%.**

(Module 21.2, LOS 21.g)

32. (C) risky assets in existence.

Explanation

The market portfolio, in theory, contains all risky assets in existence. It does not contain any risk-free assets.

(Module 21.1, LOS 21.b)

33. (A) half the returns standard deviation of the risky asset.

Explanation

A risk-free asset has a standard deviation of returns equal to zero and a correlation of returns with any risky asset also equal to zero. As a result, the standard deviation of returns of a portfolio of a risky asset and a risk-free asset is equal to the weight of the risky asset multiplied by its standard deviation of returns. For an equally weighted portfolio, the weight of the risky asset is 0.5 and the portfolio standard deviation is 0.5 × the standard deviation of returns of the risky asset.

(Module 21.1, LOS 21.a)

34. (A) portfolio Y only.

Explanation

Portfolio X's required return is 0.05 + 0.9 × (0.12-0.05) = 11.3%. It is expected to return 13%. The portfolio has an expected excess return of 1.7%.

Portfolio Y's required return is 0.05 + 1.1 × (0.12-0.05) = 12.7%. It is expected to return 14%. The portfolio has an expected excess return of 1.3%.

Since both portfolios are undervalued, the investor should sell the portfolio that offers less excess return. Sell Portfolio Y because its excess return is less than that of Portfolio X.

(Module 21.2, LOS 21.h)

35. (B) overvalued by approximately 1.8%.

Explanation

To determine whether a stock is overvalued or undervalued, we need to compare the expected return (or holding period return) and the required return (from Capital Asset Pricing Model, or CAPM).

Step 1: Calculate Expected Return (Holding period return)

The formula for the (one-year) holding period return is:

HPR = $(D_1 + S_1 – S_0) / S_0$, where D = dividend and S = stock price.

Here, HPR = (1.50 + 39 – 35) / 35 = 15.71%

Step 2: Calculate Required Return

The formula for the required return is from the CAPM:

$RR = R_f + (ER_M – R_f) \times Beta$

Here, we are given the information we need except for Beta. Remember that Beta can be calculated with: $Beta_{stock} = [cov_{S,M}] / [\sigma^2_M]$.

Here we are given the numerator and the denominator, so the calculation is: $0.85 / 0.70^2 1.73$. RR = 4.50% + (12.0 – 4.50%) × 1.73 = 17.48%.

Step 3: Determine over/under valuation

The required return is greater than the expected return, so the security is overvalued.

The amount = 17.48% – 15.71% = 1.77%.

(Module 21.2, LOS 21.h)

36. (C) Treynor measure.

Explanation

The Treynor measure is excess return relative to beta. The Sharpe ratio measures excess return relative to standard deviation. Jensen's alpha measures a portfolio's excess return relative to return of a portfolio on the SML that has the same beta.

(Module 21.2, LOS 21.i)

37. (C) contain the same mix of risky assets unless only the risk-free asset is held.

Explanation

All portfolios on the CML include the same tangency portfolio of risky assets, except the intercept (all invested in risk-free asset). The tangency portfolio contains none of the risk free asset and "borrowing portfolios" can be constructed with a negative allocation to the risk-free asset. Portfolios on the CML are efficient (well-diversified) and have no unsystematic risk.

(Module 21.1, LOS 21.c)

38. (B) It is when the security market line (SML) and capital market line (CML) converge.

Explanation

The CML plots expected return versus standard deviation risk. The SML plots expected return versus beta risk. Therefore, they are lines that are plotted in different twodimensional spaces and will not converge.

(Module 21.2, LOS 21.f)

39. (A) Firm-specific risk can be reduced through diversification.

Explanation

The other statements are false. Market risk cannot be reduced through diversification; market risk = systematic risk. The two classes of risk are unsystematic risk and systematic risk.

(Module 21.1, LOS 21.c)

40. (C) 0.725.

Explanation

Sharpe ratio = (22% – 7.50%) / 20% = 0.725.

(Module 21.2, LOS 21.i)

41. (A) single-factor model.

Explanation

The market model is a single-factor model. The single factor is the expected excess return on the market portfolio, or [$E(R_m)$ – RFR].

(Module 21.1, LOS 21.d)

42. (A) 0.61 0.66

Explanation

$Beta_i = (s_i/s_M) \times r_{I,\,M}$

BetaPNS = (0.18/0.22) × 0.75 = 0.6136

BetaInCharge = (0.17/0.22) × 0.85 = 0.6568

(Module 21.1, LOS 21.e)

43. (A) 11.3%.

Explanation

The formula for the required return is: $ER_{stock} = R_f + (E_{RM} – R_f) \times Beta_{stock}$ or 0.035 + 1.3 × (0.095 - 0.035) = 0.113, or 11.3%.

(Module 21.2, LOS 21.g)

44. (A) Remains the same Decreases

Explanation

As randomly selected securities are added to a portfolio, the diversifiable (unsystematic) risk decreases, and the expected level of nondiversifiable (systematic) risk remains the same.

(Module 21.1, LOS 21.c)

45. (C) 17.4%.

Explanation

$RR_{Stock} = R_f + (R_{Market} – R_f) \times Beta_{Stock}$, where RR = required return, R = return, and R_f =risk-free rate, and $(R_{Market} – R_f)$ = market premium

Here, $RR_{Stock} = 7 + (8 \times 1.3) = 7 + 10.4 =$ **17.4%.**

(Module 21.2, LOS 21.g)

46. (C) 20.4%.

Explanation

$RR_{Stock} = R_f + (R_{Market} - R_f) \times Beta_{Stock}$, where RR= required return, R = return, and R_f =risk-free rate.

Here, $RR_{Stock} = 6 + (12) \times 1.2 = 6 + 14.4 = 20.4\%$. We are given the market risk premium$E(R_{mkt}) – Rf$, not the expected return on the market.

(Module 21.2, LOS 21.g)

47. (B) nonsystematic risk can be eliminated by diversification.

Explanation

In equilibrium, investors should not expect to earn additional return for bearing nonsystematic risk because this risk can be eliminated by diversification. Individual securities have both systematic and nonsystematic risk. Systematic risk is market risk; non-systematic risk is specific to individual securities.

(Module 21.1, LOS 21.c)

48. (A) a line tangent to the efficient frontier, drawn from the risk-free rate of return.

Explanation

The Capital Market Line is a straight line drawn from the risk-free rate of return (on the Y axis) through the market portfolio. The market portfolio is determined as where that straight line is exactly tangent to the efficient frontier.

(Module 21.1, LOS 21.b)

49. (C) No investor is large enough to influence market prices.

Explanation

The CAPM assumes all investors are price takers and no single investor can influence prices. The CAPM also assumes markets are free of impediments to trading and that all investors are risk averse and have the same one-period time horizon.

(Module 21.2, LOS 21.f)

50. (C) Lambda.

Explanation

In the context of the SML, a security is underpriced if its required return is less than its estimated holding period return, is overpriced if its required return is greater than its estimated holding period return, and is correctly priced if its required return is equal to its estimated holding period return.

Here, estimated holding period return is calculated as: (ending price – beginning price + cash flows) / beginning price. The required return based on the CAPM is: risk free rate + Beta × (expected market rate − risk free rate).

- For Alpha: ER = (31 – 25 + 2) / 25 = 32%, RR = 4 + 1.6 × (12 – 4) = 16.8%. Stock is underpriced.
- For Omega: ER = (110 – 105 + 1) / 105 = 5.7%, RR = 4 + 1.2 × (12 – 4) = 13.6%. Stock is overpriced.
- For Lambda, ER = (10.8 – 10) / 10 = 8%, RR = 4 + 0.5 × (12 – 4) = 8%. Stock is correctly priced.

(Module 21.2, LOS 21.h)

51. (B) are not necessarily well diversified, while portfolios on the CML are well diversified.

Explanation

Although the risk measure on the capital market line diagram is total risk, all portfolios that lie on the CML are well diversified and have only systematic risk. This is because portfolios on the CML are all constructed from the risk-free asset and the (well-diversified) market portfolio. Any portfolio, including single securities, will plot along the SML in equilibrium. Their unsystematic risk can be significant, but it is not measured on the SML diagram because unsystematic risk is not related to expected return. Both the CML and the SML reflect relations that hold when prices are in equilibrium.

(Module 21.2, LOS 21.f)

52. (B) Risk-free rate.

Explanation

The CML originates on the vertical axis from the point of the risk-free rate.

(Module 21.1, LOS 21.b)

53. (A) Unsystematic risk.

Explanation

Unsystematic risk (diversifiable risk) is the risk that is eliminated when the investor builds a well-diversified portfolio.

(Module 21.1, LOS 21.c)

54. (B) Tax rates are constant over the investment horizon.

Explanation

Both taxes and transactions costs are assumed to be zero in deriving the CAPM.

(Module 21.2, LOS 21.f)

55. (A) price momentum.

Explanation

In addition to the three factors of the Fama and French model, market-to-book, firm size, and excess returns on the market, Carhart added a momentum factor based on prior relative price performance.

(Module 21.1, LOS 21.d)

56. (B) neither security is underpriced.

Explanation

In the context of the SML, a security is underpriced if the required return is less than the holding period (or expected) return, is overpriced if the required return is greater the holding period (or expected) return, and is correctly priced if the required return equals the holding period (or expected) return.

Bahre: Expected return = 10% < CAPM Required return R = 0.07 + (1.4)(0.11-0.07) = 12.6% and is overpriced.

For Cubb: Expected return = 15% = CAPM Required return = 0.07 + (2.0)(0.11-0.07) = 15%..

(Module 21.2, LOS 21.h)

57. (B) 10.5%.

Explanation

The market risk premium is the difference between the market rate of return and the riskfree rate [i.e., the quantity (R_M – R_f)].

$k_i = R_f + \beta_i(R_M – Rf)$

k = 5% + 1.10(5%) = 10.5%

(Module 21.2, LOS 21.g)

58. (B) assets plot on the SML.

Explanation

When the market is in equilibrium, expected returns equal required returns. Since this means that all assets are correctly priced, all assets plot on the SML. By definition, all stocks and portfolios other than the market portfolio fall below the CML. (Only the market portfolio is efficient.)

(Module 21.2, LOS 21.f)

59. (C) borrowing at the risk-free rate to invest in the risky market portfolio.

Explanation

Investing on margin in the market portfolio will increase both risk and expected returns. This strategy would be mean-variance efficient. Other strategies such as shifting a portion of total funds to higher risk assets would achieve the higher return goal but would leave the portfolio below the CML and thus would not be an optimal strategy.

(Module 21.1, LOS 21.b)

60. (B) borrow and invest in the market portfolio.

Explanation

Portfolios that lie to the right of the market portfolio on the capital market line ("up" the capital market line) are created by borrowing funds to own more than 100% of the market portfolio (M). The statement, "diversify the portfolio even more" is incorrect because the market portfolio is fully diversified.

(Module 21.1, LOS 21.b)

61. (A) -1.0%.

Explanation

RR_{Stock} = Rf + (R_{Market} – R_f) × $Beta_{Stock}$, where RR = required return, R = return,and R_f = risk-free rate

A bit of algebraic manipulation results in:

R_{Market} = [RR_{Stock} – R_f + ($Beta_{Stock}$ × R_f)] / $Beta_{Stock}$ = [8 – 5 + (-0.5 × 5)] / -0.5 = 0.5/ -0.5 = **-1%**

(Module 21.2, LOS 21.g)

62. (C) Stock Z is properly valued.

Explanation

Using the CAPM, the required rate of return for each stock is:

$E(R_X)$ = 4% + 1.0(10% − 4%) = 10.0%.

10.0% − 10.0% = 0.0%, properly valued.

$E(R_Y)$ = 4% + 1.6(10% − 4%) = 13.6%.

16.0% − 13.6% = 2.4% undervalued.

$E(R_Z)$ = 4% + 2.0(10% − 4%) = 16.0%.

16.0% − 16.0% = 0.0%, properly valued.

(Module 21.2, LOS 21.h)

63. (A) M-squared.

Explanation

M-squared measures the excess return of a leveraged portfolio relative to the market portfolio and produces the same portfolio rankings as Sharpe ratio. **(Module 21.2, LOS 21.i)**

64. (B) 0.024.

Explanation

From the fact that $beta_i = Cov_{i,mkt}/ Var_{mkt}$, we have $Cov_{i,mkt} = beta_i \times var_{mkt}$

$Cov_{i,mkt} = 1.2 \times 0.14^2 = 0.02352$.

(Module 21.1, LOS 21.e)

65. (A) rate of return.

Explanation

The market model is expressed as: $R_i = \alpha_i + \beta_i R_m + \varepsilon_i$. In this model, beta ($\beta_i$) measures the sensitivity of the rate of return on an asset (Ri) to the market rate of return (R_m).

(Module 21.1, LOS 21.d)

66. (B) Combining the capital market line (CML) (risk-free rate and efficient frontier) with an investor's indifference curve map separates out the decision to invest from the decision of what to invest in.

Explanation

Combining the CML (risk-free rate and efficient frontier) with an investor's indifference curve map separates out the decision to invest from what to invest in and is called the separation theorem. The investment selection process is thus simplified from stock picking to efficient portfolio construction through diversification. The other statements are false. As an investor diversifies away the unsystematic portion of risk, the correlation between his portfolio returns and that of the market approaches positive one. (Remember that the market portfolio has no unsystematic risk). The SML measures systematic risk, or beta risk.

(Module 21.1, LOS 21.c)

67. (B) 0.57.

Explanation

Covariance of Bahr and the market $= 0.8 \times \sqrt{0.0225} \times \sqrt{0.0441} = 0.0252$

Bahr beta = 0.0252/0.0441= 0.57

(Module 21.1, LOS 21.e)

68. (B) The SML uses beta, but the CML uses standard deviation as the risk measure.

Explanation

The SML and CML both intersect the vertical axis at the risk-free rate. The SML describes the risk/return tradeoff for individual securities or portfolios, whereas the CML describes the risk/return tradeoff of various combinations of the market portfolio and a riskless asset.

(Module 21.2, LOS 21.f)

69. (C) 0.5296 2.20

Explanation

correlation coefficient = 0.00109 / (0.0205)(0.1004) = 0.5296.

beta of stock A = covariance between stock and the market / variance of the market

Beta = $0.002 / 0.0301^2 = 2.2$

(Module 21.1, LOS 21.e)

70. (B) firm size, book-to-market ratio, and excess return on the market portfolio.

Explanation

In the Fama and French model, the three factors that explain individual stock returns are firm size, the firm's book value-to-market value ratio, and the excess return on the market portfolio. The Carhart model added price momentum as a fourth factor.

(Module 21.1, LOS 21.d)

71. (C) Default risk.

Explanation

Default risk is based on company-specific or unsystematic risk.

(Module 21.1, LOS 21.c)

72. (B) purchase CS only.

Explanation

In the context of the SML, a security is underpriced if the required return is less than the holding period (or expected) return, is overpriced if the required return is greater than the holding period (or expected) return, and is correctly priced if the required return equals the holding period (or expected) return.Here, the holding period (or expected) return is calculated as: (ending price – beginning price + any cash flows / dividends) / beginning price. The required return uses the equation of the SML: risk free rate + Beta × (expected market rate − risk-free rate).

- For CS Industries: ER = (30 – 25 + 1) / 25 = 24%, RR = 6 + 1.2 × (15 – 6) = 16.8%. Stock is underpriced - purchase.
- For MG Consolidated: ER = (55 – 50 + 1) / 50 = 12%, RR = 6 + 0.80 × (15 – 6) = 13.2%.Stock is overpriced - do not purchase.

(Module 21.2, LOS 21.h)

73. (C) Total risk equals market risk plus firm-specific risk.

Explanation

Total risk equals systematic (market) plus unsystematic (firm-specific) risk.

The unsystematic risk for a specific firm is not similar to the unsystematic risk for other firms in the same industry. Unsystematic risk is firm-specific or unique risk.

Systematic risk of a portfolio can be changed by adding high-beta or low-beta stocks.

(Module 21.1, LOS 21.c)

74. (A) below the CML and on the SML.

Explanation

An inefficient portfolio will plot below the CML. In equilibrium, all portfolios will plot on the SML.

(Module 21.2, LOS 21.f)

75. (C) 6.0%.

Explanation

17.3 = 8 + 1.55(MRP)

9.3 = 1.55(MRP)

MRP = 9.3 / 1.55 = 6

(Module 21.2, LOS 21.g)

76. (A) The point of tangency between the capital market line (CML) and the efficient frontier.

Explanation

Capital market theory suggests that all investors should invest in the same portfolio of risky assets, and this portfolio is located at the point of tangency of the CML and the efficient frontier of risky assets. Any point below the CML is suboptimal, and points above the CML are not feasible.

(Module 21.1, LOS 21.b)

77. (A) negative.

Explanation

A security's expected Jensen's alpha is the difference between an active manager's estimate of a security's expected return and the CAPM expected return. A security that is expected to have a negative alpha will plot below the SML (i.e., the security is overvalued and should be sold or sold short).

(Module 21.2, LOS 21.i)

78. (C) Investments are not divisible.

Explanation

Capital market theory assumes that all investments are infinitely divisible. The other statements are basic assumptions of capital market theory.

(Module 21.2, LOS 21.f)

79. (B) holding more than 100% of the risky asset.

Explanation

Portfolios that lie to the right of the market portfolio on the capital market line are created by borrowing funds to own more than 100% of the market portfolio (M). The statement, "holding both the risk-free asset and the market portfolio" refers to portfolios that lie to the left of the market portfolio. Portfolios that lie to the left of point M are created by lending funds (or buying the risk free-asset). These investors own less than 100% of both the market portfolio and the risk-free asset. The portfolio at point Rf (intersection of the CML and the y-axis) is created by holding 100% of the risk-free asset. The statement, "fully diversifying" is incorrect because the market portfolio is fully diversified.

(Module 21.1, LOS 21.b)

80. (A) a standardized measure of the total risk of a security.

Explanation

Beta is a standardized measure of the systematic risk of a security. $\beta = Covr,mkt/\sigma 2mkt$

Beta is multiplied by the market risk premium in the CAPM: $E(Ri) = RFR + \beta[E(Rmkt) – RFR]$.

(Module 21.1, LOS 21.e)

81. (A) actual rate of return less the expected risk-adjusted rate of return.

Explanation

Abnormal return = Actual return – expected risk-adjusted return

(Module 21.2, LOS 21.h)

82. (A) 4.

Explanation

$30 = 6 + \beta (12 - 6)$

$24 = 6\beta$

$\beta = 4$

(Module 21.1, LOS 21.e)

83. (C) zero.

Explanation

The risk-free asset has zero correlation of returns with any portfolio of risky assets.

(Module 21.1, LOS 21.a)

84. (C) single-factor model.

Explanation

A model that estimates a stock's expected excess return based only on the book-to-market ratio is a single-factor model. The market model is a single-factor model that estimates expected excess return based on a security's sensitivity to the expected excess return of the market portfolio. A multifactor model would estimate expected excess return based on more than one factor.

(Module 21.1, LOS 21.d)

85. (A) excess return per unit of risk.

Explanation

The slope of the CML indicates the excess return (expected return less the risk-free rate) per unit of risk.

(Module 21.1, LOS 21.b)

86. (C) is undervalued.

Explanation

The required return based on systematic risk is computed as: $ER_{stock} = R_f + (ER_M – R_f) \times Beta_{stock}$, or $0.04 + (0.085 – 0.04) \times 1.9 = 0.1255$, or 12.6%. The expected return is computed as: $(P_1 – P_0 + D_1) / P_0$, or ($27 – $23 + $0.50) / $23 = 0.1957, or 19.6%. The stock is above the security market line ER > RR, so it is undervalued.

(Module 21.2, LOS 21.h)

87. (B) portfolio that maximizes his utility on the Capital Market Line.

Explanation

Given the Capital Market Line, the investor chooses the portfolio that maximizes his utility.That portfolio may be exactly the market portfolio or it may be some combination of the risk-free asset and the market portfolio.

(Module 21.1, LOS 21.b)

88. (C) Lambda.

Explanation

An expected decline in the overall market suggests the stock with the lowest beta (Lambda) and, therefore, the least sensitivity to the market should have the highest expected rate of return.

$RR_{Stock} = Rf + (R_{Market} – R^f) \times Beta_{Stock}$, where RR = required return, R_f = risk-free rate, and R_{Market} = market rate of return

Alpha: 4% + 1.6(–3% – 4%) = –7.2%

Omega: 4% + 1.2(–3% – 4%) = –4.4%

Lambda: 4% + 0.5(–3% – 4%) = +0.5%

(Module 21.2, LOS 21.h)

89. (C) systematic risk.

Explanation

Beta is a measure of systematic risk.

(Module 21.1, LOS 21.e)

90. (A) Investors can lend at the risk-free rate, but borrow at a higher rate.

Explanation

Capital market theory assumes that investors can borrow or lend at the risk-free rate. The other statements are basic assumptions of capital market theory.

(Module 21.2, LOS 21.f)

91. (A) properly valued.

Explanation

Based on the CAPM, the portfolio should earn: E(R) = 0.05 + 1.5(0.15 − 0.05) = 0.20 or 20%.On a risk-adjusted basis, this portfolio lies on the SML and is, thus, properly valued.

(Module 21.2, LOS 21.h)

92. (B) 0.89.

Explanation

The formula for beta is: $(Cov_{stock,market})/(Var_{market})$, or $(0.003)/(0.058)^2 = 0.89$.

(Module 21.1, LOS 21.e