

Question #1 of 125

Question ID: 464565

Which of the following is an implication of the capital asset pricing model for investor's portfolio decisions?

- ✓ **A) All investors will hold some combination of a broadly based market index and the risk-free asset.**
- X B) Less risk-averse investors will overweight high-beta stocks relative to the market portfolio.
- X C) Less risk-averse investors will hold less of a broadly based index and more of the risk-free asset.

Explanation

The CAPM suggests that all investors should hold some combination of the market portfolio and the risk-free asset. Less risk-averse investors will hold more of the market portfolio (and move farther up the CML) and more risk-averse investors will hold more of the risk-free asset (and move farther down the CML).

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Question ID: 464445

Which of the following is NOT an assumption necessary to derive the single-factor market model? The:

- ✓ **A) market portfolio is the tangency portfolio.**
- X B) expected value of firm-specific surprises is zero.
- X C) firm-specific surprises are uncorrelated across assets.

Explanation

The result that the market portfolio is the tangency portfolio is a prediction of the CAPM model, not the market model. The market model assumes that there are two sources of risk, unanticipated macroeconomic events and firm-specific events. We use the return on the market portfolio as a *proxy* for the macroeconomic factor and assume all stocks have varying degrees of sensitivity to this macro factor. In addition, each stock's returns are uniquely affected by firm-specific events uncorrelated across stocks and with the macro events. The remaining choices are the assumptions necessary to derive the single-factor market model.

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Question ID: 464341

Jill Matton, CFA, has been asked to invest \$100,000, choosing one or more of the following three stocks. All stocks have the same expected return and standard deviation. The correlation matrix for the three stocks is given below:

Stock Correlations			
	X	Y	Z

X	1.00	0.15	0.70
Y	0.15	1.00	0.51
Z	0.70	0.51	1.00

Which of the three stocks, X, Y, and Z, should be included in the portfolio?

- ☐ A) Any investment in the three stocks will result in the exact same expected return and risk.
- ☒ B) X, Y, and Z.
- ☐ C) X and Y only.

Explanation

Diversification benefits occur whenever a stock is added that is not perfectly positively correlated with other stocks in the portfolio. Since none of the stocks are perfectly positively correlated with the other stocks, it would be beneficial to purchase all three rather than just one or two stocks.

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Question ID: 464512

Assume you are attempting to estimate the equilibrium expected return for a portfolio using a two-factor arbitrage pricing theory (APT) model. One factor is changes in the 30-year T-bond rate and the other factor is the percentage growth in gross national product (GNP). Assume that you have estimated the risk premium for the interest rate factor to be 0.02, and the risk premium on the GNP factor to be 0.03. The sensitivity of the portfolio to the interest rate factor is -1.2 and the portfolio's sensitivity to the GNP factor is 0.80. Given a risk free rate equal to 0.03, what is the expected return for the asset?

- ☐ A) 5.0%.
- ☐ B) 2.4%.
- ☒ C) 3.0%.

Explanation

The general form of the two-factor APT model is: $E(R_{\text{Port}}) = R_F = \lambda_{\text{interest}}\beta_{\text{interest}} + \lambda_{\text{GNP}}\beta_{\text{GNP}}$, where the λ 's are the factor risk premiums and the β 's are the portfolio's factor sensitivities. Substituting the appropriate values, we have:

$$R_{\text{Port}} = 0.03 + 0.02(-1.2) + 0.03(0.80) = 3.0\%$$

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Question ID: 464311

Mean-variance analysis assumes that investor preferences depend on all of the following EXCEPT:

- ☒ A) skewness of the distribution of asset returns.
- ☐ B) correlations among asset returns.
- ☐ C) expected asset returns.

Explanation

Mean-variance analysis assumes that investors only need to know expected returns, variances, and covariances in order to create optimal portfolios. The skewness of the distribution of expected returns can be ignored.

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Question ID: 464420

Jung Wu, CFA, uses the security market line to determine if stocks are undervalued or overvalued. Wu recently completed an analysis of Sang Tractor Supplies (STS) and derived the following forecasts for STS and for the broad market:

- Forecasted return for STS: 10%
- Standard deviation forecasted for STS: 15%
- Expected return on the stock market index: 12%
- Standard deviation on the stock market index: 20%
- Correlation between STS and stock market index: 0.60
- Risk-free rate: 6%

To determine the fair value of STS, Wu should use the following risk value and should make the following valuation decision:

<u>Risk value</u>	<u>Valuation</u>
✓ A) 0.45	Undervalued
x B) 0.15	Overvalued
x C) 0.45	Overvalued

Explanation

Wu uses the security market line as his framework of analysis. The appropriate risk measure for the security market line is the stock's beta. The formula for beta equals:

$$\beta = \frac{\text{cov}_{im}}{\sigma_m^2} = \frac{\rho_{im}\sigma_i}{\sigma_m} = \frac{(0.60)(0.15)}{0.20} = 0.45$$

where cov_{im} is the covariance between any asset i and the market index m , σ_i is the standard deviation of returns for asset i , σ_m is the standard deviation of returns for the market index, ρ_{im} is the correlation between asset i and the market index.

To determine the fair valuation for STS, Wu must compare his forecasted return against the equilibrium expected return using his security market line framework of analysis. The equation for the security market line is the capital asset pricing model:

$$E(R) = R_F + \beta[E(R_m) - R_F] = 0.06 + 0.45[0.12 - 0.06] = 0.087 = 8.7\%.$$

Wu's forecasted (10%) exceeds the equilibrium expected (or required) return for STS. Therefore, Wu should determine that STS is undervalued (should make a buy recommendation).

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Question ID: 464398

According to the capital asset pricing model (CAPM), if the expected return on an asset is too low given its beta, investors will:

- x A) buy the stock until the price rises to the point where the expected return is again equal to that predicted by the security market line.

- ✓ **B)** sell the stock until the price falls to the point where the expected return is again equal to that predicted by the security market line.
- ✗ **C)** sell the stock until the price rises to the point where the expected return is again equal to that predicted by the security market line.

Explanation

The CAPM is an equilibrium model: its predictions result from market forces acting to return the market to equilibrium. If the expected return on an asset is temporarily too low given its beta according to the SML (which means the market price is too high), investors will sell the stock until the price falls to the point where the expected return is again equal to that predicted by the SML

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Question ID: 464416

Kaskin, Inc., stock has a beta of 1.2 and Quinn, Inc., stock has a beta of 0.6. Which of the following statements is *most* accurate?

- ✗ **A)** The stock of Kaskin, Inc., has more total risk than Quinn, Inc.
- ✓ **B)** The expected rate of return will be higher for the stock of Kaskin, Inc., than that of Quinn, Inc.
- ✗ **C)** The stock of Quinn, Inc., has more systematic risk than that of Kaskin, Inc.

Explanation

Beta is a measure of systematic risk. Since only systematic risk is rewarded, it is safe to conclude that the expected return will be higher for Kaskin's stock than for Quinn's stock.

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Question ID: 464567

In the context of multi-factor models, investors with lower-than-average exposure to recession risk (e.g. those without labor income) can earn a risk premium for holding dimensions of risk unrelated to market movements by creating equity portfolios with:

- ✓ **A)** greater-than-average exposure to the recession risk factor.
- ✗ **B)** greater-than-average market risk exposure.
- ✗ **C)** less-than-average exposure to the recession risk factor.

Explanation

Multifactor models allow us to capture other dimensions of risk besides overall market risk. Investors with unique circumstances different than the average investor may want to hold portfolios tilted away from the market portfolio in order to hedge or speculate on factors like recession risk, interest rate risk or inflation risk. An investor with lower-than-average exposure to recession risk can earn a premium by creating greater-than-average exposure to the recession risk factor. In effect, he earns a risk premium determined by the average investor by taking on a risk he doesn't care about as much as the average investor does.

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Question ID: 464389

Callard Corp. stock has a beta of 1.5. If the current risk-free interest rate is 6%, and the expected return on the market is 14%, what is the expected rate of return for Callard Corp.'s stock?

- ☐ A) 14%.
- ☐ B) 20%.
- ☒ C) 18%.

Explanation

$$ER_{cc} = 0.06 + 1.5(0.14 - 0.06) = 18\%$$

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Question ID: 464519

Gold Horizon, an investment firm, utilizes a three-factor APT model for its Unique & Rich (U&R) fund. The risk-free rate equals 4%. Using the table below, determine U&R's expected return.

	<i>GNP Factor</i>	<i>Inflation Factor</i>	<i>Investor Confidence Factor</i>
U&R factor beta	1.75	1.5	1.25
Factor risk premium	0.020	0.015	0.013

- ☐ A) 4.49%.
- ☒ B) 11.38%.
- ☐ C) 7.38%.

Explanation

$$E(R_{U\&R}) = 0.04 + 1.75(0.02) + 1.5(0.015) + 1.25(0.013)$$

$$E(R_{U\&R}) = 0.04 + 0.035 + 0.0225 + 0.01625$$

$$E(R_{U\&R}) = 11.375\% \approx 11.38\%$$

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Question ID: 464502

The Arbitrage Pricing Theory (APT) has all of the following characteristics **EXCEPT** it:

- ☐ A) assumes that asset returns are described by a factor model.
- ☐ B) is an equilibrium pricing model.
- ☒ C) assumes that arbitrage opportunities are available to investors.

Explanation

The APT assumes that *no* arbitrage opportunities are available to investors.

Questions #13-18 of 125

Chris McDonald, CFA, is a portfolio manager for InvesTrack, a firm that seeks to closely track a selected index or indexes with each of its funds. McDonald is analyzing the returns of several of InvesTrack's managed funds. The primary fund, Marketrack, (also known as the MT portfolio), tracks a combination of a major stock index, a bond index, a real estate index, and a precious metals index. The stock index in the MT portfolio closely follows the S&P 500. The weights on each of the indexes in the MT target portfolio are approximately the same as the weights that the analysts at InvesTrack have estimated for these assets in the overall economy. McDonald believes that the MT portfolio is more likely to lie on the efficient frontier than a portfolio of only stocks. In a recent discussion with his assistants, Joseph Kreager and Maria Ito, McDonald stated the low correlations between classes such as precious metals and real estate in the portfolio will improve the diversification of the portfolio. Kreager proposes that the ultimate goal should be to combine assets to achieve the minimum variance portfolio on the efficient frontier.

McDonald proposes that the returns of the MT portfolio can serve as a better representation of a market portfolio than an index like the Dow Jones Industrial Average or the S&P 500, which many analysts and portfolio managers use as a market proxy. For example, he asserts that betas estimated using the MT portfolio will be a more realistic representation of systematic risk, and this will make the betas more reliable in decisions concerning the effects of diversification. Furthermore, he suggests that the capital asset line (CAL) based upon the MT portfolio as the risky asset should be steeper than the CAL based upon the S&P 500 alone as the risky asset.

Kreager claims that that the MT portfolio will only have steeper CAL if the average returns of the indexes other than the stock index in the MT tracking portfolio are higher than the S&P 500.

Ito responds that MT portfolio CAL will be higher than the S&P 500 CAL only if the standard deviation of the returns of the other indexes in the MT tracking portfolio are lower than the S&P 500.

Recently a customer holding a position in TTX stock wanted to explore the purchase of shares in a real estate investment trust (REIT). McDonald ran a regression of the return of the TTX stock on the return of the MT portfolio, and he also ran a regression of the REIT's return on the return of MT portfolio. The market model regressions are:

$$(\text{Return of the TTX stock})_t = -0.018 + 1.30 \times (\text{Return of MT portfolio})_t + \varepsilon_t$$

$$(\text{Return of the REIT})_t = 0.018 + 0.70 \times (\text{Return of MT portfolio})_t + \varepsilon_t$$

The standard deviations of returns for each of these investments are $\sigma_{\text{TTXstock}} = 38.0\%$, $\sigma_{\text{REIT}} = 24.0\%$, and $\sigma_{\text{MT}} = 16.0\%$. McDonald asks Kreager to compute the variance-covariance matrix based upon these results. He also asks Kreager to compute the standard deviation of the unexplained risk for each of the assets.

After performing the regressions, Kreager investigates the property of beta drift. He finds that the betas of both the TTX stock and the REIT both follow an AR(1) process:

$$\beta_{t+1} = 0.1 + 0.9 \times \beta_t$$

Using this AR(1) process, Kreager tries to determine if the covariance between the two assets will increase or decrease in the next time period. He assumes the variance of the MT portfolio will remain the same.

After viewing the statistics, Ito gathers information on the S&P 500 and finds that its average return is 12.0%, and the standard deviation is 20.0%. The current risk-free rate is 5.0%. She wants to investigate whether McDonald's assertion that the MT portfolio CAL is steeper than the S&P 500 CAL is true. The expected return for the MT portfolio is 11%.

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Question ID: 464371

Considering Kreager and Ito's responses to McDonald's proposition that the CAL of the MT portfolio should be steeper than

that of the S&P 500:

- ✓ **A) both are incorrect.**
- ✗ **B) only one is correct.**
- ✗ **C) both are correct.**

Explanation

Kreager asserts that the CAL will be steeper if the average returns on the non-stock indexes are greater than the S&P 500. However the slope (i.e., the Sharpe Ratio) also depends upon the standard deviation of the MT portfolio. Without further information, it is impossible to know if Kreager is correct, but his statement is clearly not correct taken in isolation.

Ito's assertion that the CAL will be steeper if the standard deviations of the non-stock indexes are less than the S&P 500 can be analyzed similarly. Again, without further information, it is impossible to know if Ito is correct, but her statement is clearly not correct taken in isolation. (LOS 57.d)

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Question ID: 464372

In response to Kreager's assertion that the goal is to try to achieve the minimum variance portfolio on the efficient frontier, McDonald should *most appropriately*:

- ✓ **A) disagree.**
- ✗ **B) agree.**
- ✗ **C) agree only if it can be achieved with long positions in assets.**

Explanation

Any portfolio on the efficient frontier with a return greater than the minimum variance portfolio can be combined with the risk-free asset to create a portfolio that has a superior risk-return tradeoff when compared with the minimum variance portfolio. Thus, achieving the minimum variance portfolio would not be a worthwhile goal. (LOS 57.b)

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Question ID: 464373

If the CAL of the S&P 500 is equal to the CAL of the MT portfolio, the return of the MT portfolio is *closest to*:

- ✓ **A) 10.6%.**
- ✗ **B) 11.4%.**
- ✗ **C) 8.6%.**

Explanation

The CAL of the S&P 500 is $0.35 = (0.12 - 0.05) / 0.20$. To find the return that gives this slope for the CAL, Ito would solve for R in the expression $0.35 = (R - 0.05) / 0.16$. This gives $0.056 = R - 0.05$, $R = 0.106$. (LOS 57.d)

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Question ID: 464375

For the capital asset pricing model, the beta of TTX using the MT portfolio as the market index is:

- ✗ **A) 1.30.**
- ✗ **B) 1.00.**
- ✓ **C) 1.25.**

Explanation

The expected return for TTX from the market model is $-0.018 + 1.30 \times (\text{Return of MT portfolio}) = -0.018 + 1.30 \times 0.11 = 0.125$ or 12.5%. The risk-free return is given as 5.0%. The CAPM equation states that expected return = risk-free rate + $\beta(\text{market return} - \text{risk-free rate})$. For TTX then, $0.125 = 0.05 + \beta(0.11 - 0.05)$, so $0.075 = \beta(0.06)$, and thus $\beta = 1.25$. (LOS 57.f)

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Question ID: 464376

The beta of the REIT relative to the MT portfolio is 0.75. The standard deviation of the unexplained risk for the REIT is:

- ☒ A) 0.0576.
- ☒ B) 0.2078.
- ☒ C) 0.0432.

Explanation

To calculate standard deviation of firm-specific or unexplained risk, use $\text{variance} = \beta_i^2 \sigma_M^2 + \sigma_\epsilon^2$ to back out the variance of the unexplained risk, σ_ϵ^2 . The beta is 0.75, the market variance is (0.16), and the variance of the REIT is (0.24)². Thus $0.0576 = (0.75)^2 \times 0.0256 + \text{unexplained variance}$, so unexplained variance = 0.0432. The standard deviation is square root of the variance or 20.78%. (LOS 57.d)

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Question ID: 464377

Which of the following statements regarding the beta drift of REIT is *most* accurate?

- ☒ A) The covariance of returns will increase as the beta drifts.
- ☒ B) Compared to the common $\alpha_0 = 1/3$ and $\alpha_1 = 2/3$ method for adjusting beta, the AR(1) formula $\beta_{t+1} = 0.1 + 0.9 \times \beta_t$ should converge faster.
- ☒ C) The drift formula is mean reverting and the beta converges toward 1.

Explanation

The beta drift as defined by the AR(1) time series formula of $\beta_{t+1} = 0.1 + 0.9 \times \beta_t$, shows that the beta is mean reverting toward one. If the beta is greater than one, the next period, the beta will decrease and if the beta is less than one, the next period, the beta will increase.

As beta converges toward one, the covariance will converge toward the variance, since $\beta_i = \frac{\text{Cov}_{i,M}}{\sigma_M^2}$. This means that the covariance can either decrease or increase: the covariance will decrease if the beta decreases and the covariance will increase as the beta increases.

The greater the weight on the α_0 , the faster the convergence towards a beta of one. The drift formula is a weighted average of the beta of one and the historical beta. The α_0 represents the weight of the beta of one. (LOS 57.h)

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Question ID: 464385

Which of the following are *least likely* key assumptions of the CAPM?

- ☒ A) Investors throughout the world have identical consumption baskets.
- ☒ B) Investors can borrow and lend at the risk-free rate.

☒ C) Unlimited short selling is allowed with full access to short-sale proceeds.

Explanation

The key assumptions of CAPM are that investors can borrow and lend at the risk-free rate, and that unlimited short selling is allowed with full access to short-sale proceeds. If these assumptions are violated, the market may not be efficient and the relationship between expected return and beta may not be linear. "Investors throughout the world have identical consumption baskets" is an assumption of Extended CAPM.

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Question ID: 464339

The efficient frontier enables managers to reduce that number of possible portfolios considered because the portfolios on the efficient frontier:

- ☒ A) have higher expected returns for every level of risk than all other possible portfolios.
- ☒ B) have higher risk levels for every level of expected return than all other possible portfolios.
- ☒ C) have lower risk levels for every level of expected return than all other possible portfolios.

Explanation

If we are selecting portfolios from a large number of stocks, say the S&P 500, rather than just two stocks, the number of possible combinations is extremely large. We can restrict our search for possible portfolio combinations by focusing on those portfolios on the efficient frontier. We know they dominate all the other possible choices because they offer higher return for the same level of risk.

The minimum-variance frontier consists of portfolios that have *lower risk levels for every level of expected return than all other possible portfolios*.

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Question ID: 464345

If a risk-free asset is part of the investment opportunity set, then the efficient frontier is a:

- ☒ A) straight line called the capital allocation line (CAL).
- ☒ B) curve called the efficient portfolio set.
- ☒ C) curve called the minimum-variance frontier.

Explanation

If a risk-free investment is part of the investment opportunity set, then the efficient frontier is a straight line called the capital allocation line (CAL), whether or not risky asset correlations are equal to one. The y-intercept of the CAL is the risk-free rate. The CAL is tangent to the minimum-variance frontier of risky assets.

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Question ID: 464324

What is the expected return on a portfolio with \$10 million invested in the Value Fund, \$6 million in the Growth Fund, and \$4 million in the Small-Cap Fund?

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	<i>Value</i>	<i>Growth</i>	<i>Small-Cap</i>
Expected Return	30.0%	20.0%	25.0%
Standard Deviation	24.0%	18.0%	16.0%
<i>Correlation Matrix</i>			
	<i>Value</i>	<i>Growth</i>	<i>Small-Cap</i>
Value	1.0		
Growth	0.3	1.0	
Small-Cap	0.5	0.4	1.0

✓ **A) 26.0%.**

✗ **B) 25.0%.**

✗ **C) 20.6%.**

Explanation

First calculate the portfolio weights on each fund:

$$W_{\text{Value}} = \$10 \text{ million} / \$20 \text{ million} = 0.50$$

$$W_{\text{Growth}} = \$6 \text{ million} / \$20 \text{ million} = 0.30$$

$$W_{\text{Small-Cap}} = \$4 \text{ million} / \$20 \text{ million} = 0.20$$

Then compute the expected portfolio return as the weighted average of the individual expected returns:

$$E(R_p) = (0.50)(30.0\%) + (0.30)(20.0\%) + (0.20)(25.0\%) = 26.0\%.$$

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Question ID: 464418

What is the beta of Hamburg Corp.'s stock if the covariance of the stock with the market portfolio is 0.23, and the standard deviation of the market returns is 32%?

✓ **A) 2.25.**

✗ **B) 1.65.**

✗ **C) 0.72.**

Explanation

$$\text{Beta}_H = 0.23 / (0.32)^2 = 2.25$$

Hamburg stock is, on average, more than twice as volatile as the market.

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Question ID: 464351

Which of the following statements *most accurately* describes the capital allocation line (CAL) and the capital market line (CML)? The market portfolio:

- ☐ A) always lies on both the CAL and the CML.
- ☐ B) may lie on the CML, but it always lies on the CAL.
- ☒ C) may lie on the CAL, but it always lies on the CML.

Explanation

When a minimum variance frontier is constructed in risk return space (i.e., y-axis = expected return, x-axis = standard deviation), the capital allocation line is the line emanating from the riskless return through the highest point of tangency with the minimum variance frontier. When the point of tangency is the market portfolio, the capital allocation line is the capital market line.

Question #25 of 125

Question ID: 464517

Which of the following is an assumption of the arbitrage pricing theory (APT)?

- ☐ A) Security returns are normally distributed.
- ☐ B) Investors have quadratic utility functions.
- ☒ C) Assets are priced such that no arbitrage opportunities exist.

Explanation

APT implies that investors will undertake infinitely large positions (long and short) to exploit any perceived mispricing, causing asset prices to adjust immediately to their equilibrium values.

Questions #26-31 of 125

Bill Tanner is a new associate at Global Western Investments. Tanner approaches his supervisor, Eric Simms, with some questions about risk. Specifically, Tanner lacks a complete understanding of many portfolio concepts, including the following:

- How the presence of a risk-free asset will affect the efficient frontier.
- The difference between total risk, systematic risk, and unsystematic risk.
- Market and Macroeconomic models.

Tanner is concerned with providing the best investment advice possible for his clients. He seeks advice from some of his former Midwestern college friends who now happen to be CFA charterholders. One of his old roommates suggests that he look into using the market model or a multifactor model based on the arbitrage pricing theory (APT).

Tanner researches alternative pricing models and starts to become confused as all the equations look similar. He writes down the following notes from memory:

- The intercept for the market model is derived from the APT.
- The intercept for the APT is the risk free rate.
- The intercept for a macroeconomic factor model is the expected return on the stock when there are no surprises to the factors.

Simms makes the predictions for Tanner shown in Exhibit 1.

Exhibit 1: Simm's Predictions for Tanner

Beta for Stock B	1.10
Beta for Stock C	1.50
Correlation between Stock A and the S&P 500	0.50
Standard deviation for Stock A	28%
Standard deviation for the S&P 500	20%
1-year Treasury bill rate	5%
Expected return on the S&P 500	12%

Tanner uses the market model predictions (and the S&P 500 as a proxy for the market portfolio) to calculate the covariance of Stock B and C at 0.33. Using the market model, he also determines that the systematic component of the variance for Stock B is equal to 0.048.

Next, he heads out to meet a friend, Del Torres, for lunch. Torres excitedly tells Tanner about his latest work with tracking and factor portfolios. Torres says he has developed a tracking portfolio to aid in speculating on oil prices and is working on a factor portfolio with a specific set of factor sensitivities to the Russell 2000.

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Question ID: 464456

Which of the following is the *most* appropriate response to Tanner's question about the presence of a risk-free asset and the Markowitz efficient frontier? The presence of a risk-free asset changes the characteristics of the Markowitz efficient frontier by:

- ✓ **A) converting the Markowitz efficient frontier from a curve into a linear risk/return relationship.**
- x B) allowing risk averse investors to include in their portfolios an asset that is negatively correlated with stocks, thereby reducing the risk related to investing in equities.
- x C) reducing the total risk and the systematic risk of the market portfolio.

Explanation

The presence of a risk-free asset changes the characteristics of the Markowitz efficient frontier by converting the Markowitz efficient frontier from a curve into a straight line called the capital market line (CML). (Study Session 18, LOS 57.b)

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Question ID: 464457

Which of the following statements *best* describes the concept of systematic risk? Systematic risk:

- ✓ **A) remains even for a well-diversified portfolio.**
- x B) as measured by the standard deviation is the only risk rewarded by the market.
- x C) is approximately equal to total risk divided by unsystematic risk.

Explanation

Systematic risk remains even if a portfolio is well diversified. (Study Session 18, LOS 57.g)

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Question ID: 464458

Are Tanner's notes on the intercepts for the pricing models correct?

- x **A) No, because the intercept for the APT is the stock's alpha.**

- ☐ B) No, because the intercept for the market model is the risk-free rate.
- ☒ C) No, because the intercept for the market model is the return on the stock when the return on the market is zero.

Explanation

Tanner is incorrect with regard to the market model. The intercept is equal to the return when the market return is zero. Tanner's other two comments on intercepts are correct. (Study Session 18, LOS 57.g)

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Question ID: 464459

The beta of Stock A is *closest* to:

- ☐ A) 0.36.
- ☒ B) 0.70.
- ☐ C) 0.50.

Explanation

$$\beta_A = \frac{0.50 \times 0.28}{0.20} = 0.70$$

(Study Session 18, LOS 57.h)

Question #30 of 125

Question ID: 464460

According to the predictions of the market model, did Tanner correctly calculate the covariance of Stock B and C and Stock B's systematic component of variance?

<u>Covariance</u>	<u>Systematic component</u>
<input checked="" type="radio"/> A) No	Yes
<input type="radio"/> B) Yes	Yes
<input type="radio"/> C) Yes	No

Explanation

Tanner incorrectly calculated the covariance and correctly calculated the systematic variance component.

According to the market model, the covariance between any two stocks is calculated as the product of their betas and the variance of the market portfolio. Here, the S&P 500 is a proxy for the market portfolio.

$$\text{covariance between assets } i \text{ and } j = \text{Cov}_{ij} = \beta_i \beta_j \sigma_M^2$$

Here, $\text{Cov}_{B,C} = 1.10(1.50)(0.2)^2 = 0.066$. Tanner incorrectly used the standard deviation of the market.

The variance of the returns on asset *i* consists of two components: a systematic component related to the asset's beta, $\beta_i^2 \sigma_M^2$, and an unsystematic component related to firm-specific events, σ_{ϵ}^2 .

For Stock B, the systematic component = $1.10^2(0.2)^2 = 0.048$ (Study Session 18, LOS 57.a)

Question #31 of 125

Question ID: 464461

Did Torres correctly describe tracking and factor portfolios?

	<u>Tracking</u>	<u>Factor</u>
--	-----------------	---------------

- | | |
|----------|-----|
| ✓ A) No | No |
| x B) Yes | No |
| x C) No | Yes |

Explanation

Torres reversed the concepts and is thus incorrect on both counts. A factor portfolio is a portfolio with a factor sensitivity of 1 to a particular factor and zero to all other factors. It represents a pure bet on one factor, and can be used for speculation or hedging purposes. A tracking portfolio is a portfolio with a specific set of factor sensitivities. Tracking portfolios are often designed to replicate the factor exposures of a benchmark index like the Russell 2000. (Study Session 18, LOS 57.m)

Question #32 of 125

Question ID: 464516

Which of the following is an assumption of the arbitrage pricing theory (APT)?

- x A) Investors have quadratic utility functions.
- ✓ B) No arbitrage opportunities exist.
- x C) Returns are normally distributed.

Explanation

APT assumes that:

- Asset returns are described by a multiple factor process.
- There are enough stocks that unsystematic risk can be diversified away.
- No arbitrage opportunities exist.

Questions #33-38 of 125

Howard Michaels, CFA, is an analyst for Donaldson Associates. Michaels is considering recommending a position in the retail sector for Donaldson's institutional clients. Michaels has gathered the following information to help guide his decision. Based on previous research, Michaels expects the market and Treasury bills to return 10% and 4%, respectively.

<i>Company</i>	<i>\$1 Discount Store</i>	<i>Everything \$5</i>
Forecasted Return	12%	11%
Standard Deviation of Returns	8%	10%

Beta	1.5	1.0
------	-----	-----

Question #33 of 125

Question ID: 464435

What would be the expected return for each investment, assuming the capital asset pricing model (CAPM) holds?

<u>Discount</u>	<u>Everything</u>
-----------------	-------------------

- | | |
|----------|-----|
| ✓ A) 13% | 10% |
| x B) 19% | 10% |
| x C) 19% | 14% |

Explanation

The expected return is the return predicted by the CAPM for a given level of systematic risk (β). To calculate the expected return for each investment, use the following formula:

$$E(R_i) = R_F + \beta_i (E(R_M) - R_F)$$

Therefore, the required for \$1 Discount = $4\% + 1.5(10\% - 4\%) = 13\%$. Similarly, the expected return for Everything \$5 = $4\% + 1.0(10\% - 4\%) = 10\%$. (LOS 57.f)

Question #34 of 125

Question ID: 464436

According to the CAPM, are these securities underpriced, overpriced, or properly priced?

<u>Discount</u>	<u>Everything</u>
-----------------	-------------------

- | | |
|------------------|-----------------|
| ✓ A) Overpriced | Underpriced |
| x B) Underpriced | Overpriced |
| x C) Underpriced | Properly priced |

Explanation

According to the CAPM, \$1 Discount Stores requires a return of 13% based on its systematic risk level of $\beta = 1.5$. However, the forecasted return is only 12%. Therefore, the security is current overvalued.

According to the CAPM Everything \$5 requires a return of 10% based on its systematic risk level of $\beta = 1.0$. However, the forecasted return is 11%. Therefore, the security is current undervalued.

To illustrate this result graphically, we plot both securities in relation to the security market line (SML). Note that β is in the independent variable on the X-axis, not σ (total risk). Since \$1 Discount is overvalued, it plots below the line while Everything \$5 is undervalued and plots above the SML. (LOS 57.f)



Question #35 of 125

Question ID: 464437

Harry Jordan, an associate of Michaels, recommends the \$1 Discount Store investment because it has a higher forecasted return and lower risk. Is Jordan's assertion correct?

- ☐ A) No, since capital market theory states that the return on investment is based on the amount of total risk of the investment.
- ☒ B) No, because according to the CAPM model, Discount is overvalued.
- ☐ C) Yes, based on the information provided, we can confirm Jordan's statement that Discount has a higher return and lower risk than Everything.

Explanation

Jordan is incorrect by basing his claim on the use of standard deviation (total risk) as the measure of risk. Capital market theory asserts that the return on an investment is based on the amount of systematic risk of the investment (β). Because the unsystematic, or security specific portion of total risk can be diversified away, an investor is only compensated for assuming systematic risk. (LOS 57.f)

Question #36 of 125

Question ID: 464438

Which of the following is *least likely* an assumption of the CAPM?

- ☐ A) Markets are perfectly competitive.
- ☒ B) Limited risk-free borrowing.
- ☐ C) Investors expectations are homogeneous.

Explanation

The CAPM assumes that unlimited risk-free borrowing and lending is permitted. (LOS 57.e)

Question #37 of 125

Question ID: 464439

According to the Markowitz decision rule, on a stand-alone investment basis, Michaels should:

- ☒ A) prefer an investment \$1 Discount Store.

- ☒ B) be indifferent between the two investments.
- ☒ C) prefer an investment in Everything \$5.

Explanation

The Markowitz decision rule states that an investor should prefer Investment X to Investment Y if X's expected return is higher than that of Y with no more risk than Y, or if X has the same expected return as Y with less risk. According to the Markowitz decision rule, Michaels should prefer the \$1 Discount Store to Everything \$5 because the \$1 Discount Store has higher expected return as Everything \$5 with a lower standard deviation. (LOS 57.b)

Question #38 of 125

Question ID: 464440

Suppose that Michaels has found the best predictor for a stock's future beta to be Expected beta = $0.33 + 0.67 \times (\text{Historical beta})$. The new expected return on the \$1 Discount Store stock using expected (adjusted) beta in the CAPM is *closest to*:

- ☒ A) 13%.
- ☒ B) 14%.
- ☒ C) 12%.

Explanation

The historical beta of \$1 Discount Store is given as 1.5. The risk-free rate (based on Treasury Bill return) is 4 percent, and so the market risk premium is $10\% - 4\% = 6\%$. The expected return on the \$1 Discount Store stock using adjusted beta in the CAPM can be calculated as follows:

$$\beta_{\text{adj}} = 0.33 + (0.67)(1.5) = 0.33 + 1 = 1.33$$

$$E(R_{\text{adj}}) = R_F + \beta_{\text{adj}}[E(R_M) - R_F] = 4\% + 1.33(6\%) = 12.0\%. \text{ (LOS 57.h)}$$

Question #39 of 125

Question ID: 464390

Raj Shankar is a security analyst who uses the capital asset pricing model (CAPM) to determine the fair valuation for stocks. Recently, Shankar examined the prospects for Mini Software Solutions (MSS), a small software company operating in Southern California. Shankar makes the following forecasts for MSS and for the broad market:

- Shankar's forecasted return for MSS: 11%
- Shankar's forecasted beta for MSS: 1.25
- Expected return on the stock market index: 12%
- Risk-free rate: 4%

Using his framework of analysis, Shankar should derive the following expected return and buy/sell recommendation for MSS:

<u>Expected Return</u>	<u>Recommendation</u>
<input checked="" type="radio"/> A) 14%	Buy
<input checked="" type="radio"/> B) 14%	Sell
<input checked="" type="radio"/> C) 10%	Sell

Explanation

The equation for the (CAPM) is:

$$E(R) = R_F + \beta[E(R_m) - R_F] = 0.04 + 1.25[0.12 - 0.04] = 0.14 = 14\%.$$

Shankar's forecasted (11%) is less than the equilibrium expected (or required) return for MSS. Therefore, Shankar should make a sell recommendation on the stock.

Question #40 of 125

Question ID: 464393

What is the expected rate of return for a stock that has a beta of 0.8 if the risk-free rate is 5%, and the market risk premium is 7%?

☒ A) 6.6%.

☒ B) 8.0%.

☒ C) 10.6%.

Explanation

$$ER_{\text{stock}} = 0.05 + 0.8(0.07) = 10.6\%$$

Question #41 of 125

Question ID: 464335

The efficient frontier is useful for portfolio management because:

☒ A) portfolios on the efficient frontier are optimal: the correlation between each efficient portfolio, and the market portfolio is negative.

☒ B) portfolios on the efficient frontier are useful as factor portfolios.

☒ C) it significantly reduces the number of portfolios a manager must consider.

Explanation

If we are selecting portfolios from a large number of stocks, say the S&P 500, rather than just two stocks, the number of possible combinations is extremely large. We can restrict our search for possible portfolio combinations by focusing on those portfolios on the efficient frontier. We know they dominate all the other possible choices because they offer higher return for the same level of risk.

Questions #42-47 of 125

Janet Bellows, a portfolio manager, is attempting to explain asset valuation to a junior colleague, Bill Clay. Bellows explanation focuses on the capital asset pricing model (CAPM). Of particular interest is her discussion of the security market line (SML), and its use in security selection.

Bellows begins with a short review of the capital asset pricing model, including a discussion about its assumptions regarding transaction costs, taxes, holding periods, return requirements, and borrowing and lending at the risk-free rate.

Bellows then illustrates the SML, and explains how changes in the expected market return and the risk-free rate affect the line.

In an effort to learn whether Clay understands the concepts she has explained to him, Bellows decides to test Clay's knowledge of valuation using the CAPM.

Bellows provides the following information for Clay:

- The risk-free rate is 7%.
- The market risk premium during the previous year was 5.5%.
- The standard deviation of market returns is 35%.
- This year, the market risk premium is estimated to be 7%.
- Stock A has a beta of 1.30 and is expected to generate a 15.5% return.
- The covariance of Stock B with the market is 0.18.
- The standard deviation of Stock B's returns is 41%.

Using this information, Clay must calculate expected stock returns and betas. Bellows especially wants to know Stock A's required return, and whether or not the stock is a good buy.

Bellows then proposes a hypothetical situation to Clay: The stock market is expected to return 12.5% next year. Clay questions that return estimate in the context of the data listed above, and Bellows responds with four possible explanations for the estimate:

- The estimated risk premium is incorrect.
- Interest rates are likely to fall 1.5% over the next year.
- Given the data above, the return estimate is correct.
- The market beta is expected to rise over the next year.

Then Bellows provides Clay with the following information about Ohio Manufacturing, Texas Energy, and Montana Mining:

Stock	Ohio	Texas	Montana
Beta	0.50	XX%	1.50
Required Return	10.5%	11.0%	XX%
Expected Return	12.0%	10.0%	15.0%
Expected S&P 500 return	14.0%		

Clay has been tasked with providing an investment recommendation on the three stocks.

Question #42 of 125

Question ID: 464408

Based on the stock and market data provided above, which of the following data regarding Stock A is *most* accurate?

Required

12-month

return

Investment advice

☒ A) 16.1% Buy

☒ B) 16.1% Sell

☒ C) 14.15% Buy

Explanation

$$ER_{\text{stock}} = R_f + \beta_{\text{stock}} (ER_M - R_f) = 7\% + 1.3 (14\% - 7\%) = 16.1\%.$$

The market risk premium for the upcoming year should be used in the calculation. Stock A's required return is higher than its expected return, and as such the stock plots below the security market line. Stock A should be sold, not bought. (Study Session 18, LOS 57.f)

Question #43 of 125

Question ID: 464409

The beta of Stock B is *closest* to:

- ✓ A) 1.47.
- x B) 1.07.
- x C) 0.51.

Explanation

Beta = (covariance of stock B with the market) / (variance of the market portfolio)
 $= 0.18 / (0.35)^2 = 1.47.$

(Study Session 18, LOS 57.f)

Question #44 of 125

Question ID: 464410

Which of the following represents the *best* investment advice?

- x A) Buy Montana and Texas because their required return is lower than their expected return.
- ✓ B) Avoid Texas because its expected return is lower than its required return.
- x C) Buy Montana because it is expected to return more than Texas, Ohio, and the market portfolio.

Explanation

We can use the security market line (SML) to estimate the required return or beta on the various securities, and compare this with the expected returns.

The SML looks like this: $E(r) = R_{rf} + \beta (RP_M).$

Since Montana's beta is 1.50: $7.0 + 1.50(7.0) = 17.5\%$ = the required return. Because Montana's expected return is 15%, and the required return is 17.5%, Montana should not be purchased. Note that this is true even though Montana's expected return is more than the other stocks and the market: it is not enough to compensate for the level of market risk assumed by holding the stock.

Texas' required return = $11.0 = 7.0 + \beta(7.0)$, so $\beta = (4/7) = 0.57$. However, its expected return is less than the required return, so regardless of the beta value, Texas should not be purchased.

Ohio's required return is given as 10.5, and the expected return is 12.0. Hence, Ohio is a buy. (Study Session 18, LOS 57.f)

Question #45 of 125

Question ID: 464411

Assuming the market return estimate of 12.5% is accurate, which of the following statements is the best explanation for the estimate?

- ☐ A) Given the data above, the return estimate is correct.
- ☒ B) The estimated risk premium is incorrect.
- ☐ C) Interest rates are likely to fall 1.5% over the next year.

Explanation

The expected return on the market during the upcoming year is 14% (7% risk-free rate plus the expected 7% market risk premium). As such, the 12.5% estimate does not match the data. The most rational justification for a lower expected return is an error in the estimated risk premium. Falling interest rates may boost expected stock returns, but the current rate is the most relevant to the projected market return for the upcoming year. (Study Session 18, LOS 57.f)

Question #46 of 125

Question ID: 464412

With regard to the capital asset pricing model, relaxing assumptions about:

- ☐ A) taxes will reduce differences between the capital market lines of different investors.
- ☐ B) risk free borrowing and lending rates results in a lower intercept and steeper slope.
- ☒ C) homogeneous expectations will result in the SML appearing more as a band instead of a line.

Explanation

Taxes change investors' return expectations. Considering different marginal tax rates will result in a vast array of different after-tax requirements, leading to a vast array of CMLs and SMLs for different investors. The assumption of no transaction costs allows investors to make a profit even if a stock is just slightly off the SML. If risk-free borrowing and lending does not exist, then a portfolio of risky securities must be created such that the portfolio beta equals zero. The zero-beta portfolio is similar to the risk-free asset in that both have zero betas, but they differ in that the zero-beta portfolio has a non-zero standard deviation. The expected return on the zero-beta portfolio exceeds the risk-free rate therefore the SML will now have a higher intercept and a flatter slope. (Study Session 18, LOS 57.f)

Question #47 of 125

Question ID: 464413

If the market risk premium decreases by 1%, while the risk-free rate remains the same, the security market line:

- ☐ A) parallel-shifts downward.
- ☐ B) becomes steeper.
- ☒ C) becomes flatter.

Explanation

Since the security market line runs from the risk-free rate (RFR) through the market return, holding the RFR constant and decreasing the market risk premium will cause the SML to become flatter. (Study Session 18, LOS 57.f)

Question #48 of 125

Question ID: 464397

An investor is considering an investment. After a great deal of careful research he determines that the forecasted return on the investment is 15% and estimates the beta to be 2.0. The risk-free rate of interest is 3%, and the return on the market is 13%.

Should the project be undertaken?

- ☒ **A) No, the forecasted return is less than the expected return of 23%.**
- ☐ **B) Yes, the forecasted return is less than the expected return of 18%.**
- ☐ **C) Yes, the forecasted return is more than the expected return of 13%.**

Explanation

Per the Capital Asset Pricing Model (CAPM), the expected rate of return = $R_f + \beta[E(R_m) - R_f] = 3 + 2(13.0 - 3.0) = 23\%$.

Since the forecasted return of 15% is less than expected rate of return of 23%, the investment should not be undertaken.

Question #49 of 125

Question ID: 464485

A multi-factor model that uses unexpected changes (surprises) in macroeconomic variables (e.g., inflation and gross domestic product) as the factors to explain asset returns is called a:

- ☐ **A) fundamental factor model.**
- ☐ **B) statistical factor model.**
- ☒ **C) macroeconomic factor model.**

Explanation

Macroeconomic factor models use unexpected changes (surprises) in macroeconomic variables as the factors to explain asset returns. One example of a factor in this type of model is the unexpected change in gross domestic product (GDP) growth. In fundamental factor models, the factors are characteristics of the stock or the company that have been shown to affect asset returns, such as book-to-market or price-to-earnings ratios. A statistical factor model identifies the portfolios that best explain the historical cross-sectional returns or covariances among assets. The returns on these portfolios represent the factors.

Question #50 of 125

Question ID: 464480

The macroeconomic factor models for the returns on Omni, Inc., (OM) and Garbo Manufacturing (GAR) are:

$$R_{OM} = 20.0\% + 1.0(F_{GDP}) + 1.4(F_{QS}) + \epsilon_{OM}$$
$$R_{GAR} = 15.0\% + 0.5(F_{GDP}) + 0.8(F_{QS}) + \epsilon_{GAR}$$

What is the expected return on a portfolio invested 60% in Omni and 40% in Garbo?

- ☐ **A) 19.96%.**
- ☒ **B) 18.0%.**
- ☐ **C) 20.96%.**

Explanation

Since the expected factor surprises and expected errors are all 0 by definition, the macroeconomic factor model for the portfolio is:

$$\begin{aligned} R_P &= [(0.6)(20.0\%) + (0.4)(15.0\%)] \\ &+ [(0.6)(-1.0) + (0.4)(-0.5)] (0) \\ &+ [(0.6)(1.4) + (0.4)(0.8)] (0) \\ &+ [(0.6) \varepsilon_{OM} + (0.4)\varepsilon_{GAR}] \\ &= 18.0\% + 0.80(0) + 1.16(0) + (0.6)(0) + (0.4)(0) \end{aligned}$$

Question #51 of 125

Question ID: 464559

An analyst is constructing a portfolio for a new client. A portfolio which has factor exposures matched to those of a benchmark is:

- ☐ A) an efficient portfolio.
- ☐ B) an arbitrage portfolio.
- ☒ C) a tracking portfolio.

Explanation

A tracking portfolio has factor exposures matched to those of a benchmark.

Question #52 of 125

Question ID: 464352

The capital allocation line (CAL) with the market portfolio as the tangency portfolio is the:

- ☐ A) security market line.
- ☒ B) capital market line.
- ☐ C) minimum variance line.

Explanation

The capital market line is the capital allocation line with the market portfolio as the tangency portfolio.

Question #53 of 125

Question ID: 464315

Given the following information, what is the expected return on the portfolio of the two funds?

	<i>The Washington Fund</i>	<i>The Jefferson Fund</i>
Expected Return	30%	36%
Variance	0.0576	0.1024
Investment	\$2,000,000	\$6,000,000
Correlation	0.40	

- ✓ A) 34.5%.
- x B) 31.5%.
- x C) 33.0%.

Explanation

First calculate the portfolio weights on each fund:

$$W_{\text{Wash}} = \$2 \text{ million} / \$8 \text{ million} = 0.25$$

$$W_{\text{Jeff}} = \$6 \text{ million} / \$8 \text{ million} = 0.75$$

The expected portfolio return is the weighted average of the funds' expected returns:

$$E(R_P) = (0.25)(30\%) + (0.75)(36\%) = 34.5\%.$$

Question #54 of 125

Question ID: 464348

Consider an equally-weighted portfolio comprised of five assets in which the average asset standard deviation equals 0.57 and the average correlation between all asset pairs is -0.21 . The variance of the portfolio is *closest* to:

- x A) 10.00%.
- x B) 1.82%.
- ✓ C) 1.00%.

Explanation

$$\text{Portfolio variance} = \sigma_p^2 = (1/n) \sigma^2 + [(n-1)/n] \text{cov}$$

$$\rho_{1,2} = (\text{cov}_{1,2}) / (\sigma_1 \sigma_2) \text{ therefore } \text{cov}_{1,2} = (\rho_{1,2})(\sigma_1 \sigma_2) = (-0.21)(0.57)(0.57) = -0.068$$

$$\sigma^2 = (0.57)^2 = 0.32$$

$$\sigma_p^2 = (1/5)(0.32) + (4/5)(-0.068) = 0.064 + (-0.0544) = 0.0096 \text{ or } 1.00\%$$

Question #55 of 125

Question ID: 464470

What happens to the minimum-variance frontier when:

<u>Return forecasts fall?</u>	<u>Covariance forecasts fall?</u>
-------------------------------	-----------------------------------

- | | |
|------------------------|-------------------|
| ✓ A) Curve shifts down | Curve shifts left |
| x B) Curve shifts down | Curve shifts down |
| x C) Curve shifts left | Curve shifts down |

Explanation

When the expected return forecast declines, the minimum-variance frontier moves down. A decline in covariance forecasts will cause the curve to shift to the left.

Question #56 of 125

Question ID: 464560

The Real Value Fund is designed to have zero exposure to inflation. However its current inflation factor sensitivity is 0.30. To correct for this, the portfolio manager should take a:

- ✓ **A) 30% short position in the inflation factor portfolio.**
- x B) 30% long position in the inflation factor portfolio.
- x C) 30% short position in the inflation tracking portfolio.

Explanation

To hedge inflation, the fund should take a 30% short position in the inflation factor portfolio. This short position will fully offset the fund's positive exposure to inflation. Tracking portfolios are typically used for active asset selection and have multiple factor exposures which would prevent them from adequately hedging the inflation exposure of the fund.

Questions #57-62 of 125

Leslie Vista has never been satisfied with the capital asset pricing model (CAPM) because of its restrictive assumptions. Specifically, she is interested in Linear Theta Inc., a graphics chip manufacturer. Linear's market model beta is estimated to be 1.20 with an error variance of 11%. While the model seems to work fairly well in her own stock-valuation systems, she does not trust results that depend on assumptions that are unrealistic in the real world. Vista is a literal thinker and prefers tangible solutions. She does not hold with theory and rarely draws intuitive conclusions.

As an alternative to the CAPM, Vista decides to try out the arbitrage pricing model (APT). She likes the APT because it does not rely on the several assumptions that underlie the CAPM. Vista does some research comparing the CAPM to the APT and lists some of the assumptions of the CAPM:

- Markets are perfectly competitive.
- Investors use the Markowitz mean-variance framework.
- Represented by a multi-factor model.
- Unlimited risk-free lending and borrowing is permitted.

When Vista tells her boss, Mark Mazur, about her desire to use the APT, Mazur warns her of weaknesses in both models. Mazur also explains that the company has established the capital asset pricing model as its in-house valuation method and advises that Vista familiarize herself with how to derive the capital market line (CML) and the security market line (SML).

After reviewing studies on the CAPM and the APT, Vista decides to develop her own fundamental factor model. She establishes a proxy for the market portfolio, and then considers the importance of various factors in determining stock returns. She decides to use the following factors in her model:

- Changes in payout ratios.
- Credit rating changes.
- Companies' position in the business cycle.
- Management tenure and qualifications.

Question #57 of 125

Question ID: 464401

To compute the expected return on the portfolio using the CML, Vista needs the:

- ✓ **A) risk-free rate, market variance, portfolio variance, and expected market return.**
- x **B) market variance, portfolio beta, risk-free rate, and expected portfolio return.**
- x **C) expected market return, portfolio beta, and risk-free rate.**

Explanation

The CML is derived by using the risk-free rate, portfolio variance (standard deviation), market variance (standard deviation), and expected market return to calculate expected portfolio returns. (LOS 57.d)

Question #58 of 125

Question ID: 464402

Vista's analysis of CAPM assumptions is flawed. Which of the following assumptions that Vista noted is not part of the CAPM?

- x **A) Investors use the Markowitz mean-variance framework.**
- ✓ **B) CAPM is based on a multi-factor model.**
- x **C) Markets are perfectly competitive.**

Explanation

The CAPM is represented by a single factor model with the factor being market risk. The APT is a multifactor model where several factors could be used to explain the model's returns. (LOS 57.e)

Question #59 of 125

Question ID: 464403

Which of the following factors is *least appropriate* for Vista's factor model?

- ✓ **A) Companies' position in the business cycle.**
- x **B) Changes in payout ratios.**
- x **C) Management tenure and qualifications.**

Explanation

Fundamental factors are factors measured by characteristics of the companies themselves, like price-to-earnings (P/E) ratios or growth rates. Macroeconomic factors are economic influences on security returns. A company's position in the business cycle is dependent on the cycle itself, and cannot be accurately measured by looking at a company's fundamentals - business cycle is a macroeconomic factor. Payout ratios and management tenure are pieces of company-specific data suitable for use in a fundamental factor model. (LOS 57.j)

Question #60 of 125

Question ID: 464404

For this question only, assume that the market variance is 14%. Using the market model, Linear's return variance is *closest to*:

- ✓ **A) 31%.**
- x **B) 28%.**
- x **C) 25%.**

Explanation

$$\begin{aligned}
 \text{Using the market model, } \text{Var}(R_i) &= \beta^2 \sigma_M^2 + \sigma_e^2 \\
 &= (1.20)^2 (14) + (11) \\
 &= 31.16\%
 \end{aligned}$$

(LOS 57.g)

Question #61 of 125

Question ID: 464405

Which of the following statements made by Mazur *least accurately* identifies one of the CAPM's assumptions?

- ☒ **A) Investors can borrow and lend at the risk-free rate without limit, and they can sell short any asset in any quantity.**
- ☒ **B) An investor's optimal allocation between risky and risk-free assets will depend on their views about the risky assets' mean returns, variances of returns, and correlations.**
- ☒ **C) All assets are market traded, and investors can buy and sell assets in any quantity without affecting price.**

Explanation

The CAPM makes the assumption that investors have *identical* views about risky assets' mean returns, variances of returns, and correlations. The other statements are true. (LOS 57.e)

Question #62 of 125

Question ID: 464406

Mazur explains the concept of the market portfolio as employed by the CAPM. The *best* description of the market portfolio defined in the CAPM is that it is:

- ☒ **A) often represented in practice by a value-weighted stock index.**
- ☒ **B) inefficient, as evidenced by the relationship between expected return and beta.**
- ☒ **C) observable because it is all-inclusive.**

Explanation

The market portfolio defined in the CAPM is unobservable because it is all-inclusive. A common proxy for the market portfolio is a broad value-weighted stock index. The straight-line relationship between expected return and beta is due to the efficiency of the market portfolio. (LOS 57.e)

Questions #63-68 of 125

Sandy Wilson is a research analyst for WWW Equities Investments. She has just finished collecting the information on Table 1 to answer questions posed by her supervisor, Jackie Lewis. For example, using the Capital Market Line (CML), Lewis wants to know the market price of risk. Also, given all the attention paid to index funds in recent years, Lewis asked Wilson to see if any one of the securities would prove a better investment than the S&P 500. If not, can she compose a portfolio from stocks A, B, and C that is more efficient than the S&P 500?

Lewis wants Wilson to explore whether the results on Table 1 are congruent with the Capital Asset Pricing Model (CAPM). Using a regression analysis where the S&P 500 represents the market portfolio, she computes the beta of Stock A, and finds that it equals one. Using this, she will derive the betas of the other stocks and compare them to betas estimated with other techniques. As she performs her calculations, she reviews reasons why her results might not be congruent with the CAPM. Lewis asserts that the S&P 500 may not be a good proxy for "the market portfolio" needed for CAPM calculations.

Table 1

<i>Expected Return and Risk for Selected Investments</i>		
<i>Investment</i>	<i>Expected Return</i>	<i>Standard Deviation</i>
Stock A	12%	30%
Stock B	15%	35%
Stock C	11%	40%
S&P 500	12%	22%
Treasury Bills	3%	0%
Correlation Coefficient for Stocks A and B equals 0.4. Correlation Coefficient for Stocks A and C equals -0.5. Correlation Coefficient for Stocks B and C equals 0.1.		

Question #63 of 125

Question ID: 464305

Assuming that the S&P 500 is the market portfolio and her estimates are accurate, what is the price of risk based on the slope of the Capital Market Line (CML)?

- ☒ A) 0.545.
- ☒ B) 0.409.
- ☐ C) 0.250.

Explanation

The market price of risk, or return per unit of standard deviation risk, is determined as follows: $(0.12 - 0.03) / 0.22 = (0.09 / 0.22) = 0.409$. (Study Session 18, LOS 57.d)

Question #64 of 125

Question ID: 464306

What is the expected return and standard deviation of a portfolio that consists of 40% of stock A and 60% of stock B?

- ☒ A) Expected Return: 13.8%, Standard Deviation: 28.0%.
- ☐ B) Expected Return: 13.8%, Standard Deviation: 33.0%.
- ☐ C) Expected Return: 13.8%, Standard Deviation: 29.5%.

Explanation

$E(RP) = 0.4(0.12) + 0.6(0.15) = 0.048 + 0.09 = 0.138$ or 13.8%

The portfolio standard deviation is:

$$[(0.4)^2(0.3)^2 + (0.6)^2(0.35)^2 + 2(0.4)(0.6)(0.3)(0.35)(0.4)]^{0.5} = [0.0144 + 0.0441 + 0.02016]^{0.5} = 0.2805$$

(Study Session 18, LOS 57.a)

Question #65 of 125

Question ID: 464307

Wilson uses the computed beta of stock A, the covariance of stock A and B, and their standard deviations to compute stock B's

beta. Given stock B's expected return, the results are:

- ✓ **A) not congruent with the CAPM, which supports Lewis' assertion concerning the S&P 500 as a proxy for the market.**
- x **B) congruent with the CAPM, which does not support Lewis' assertion concerning the S&P 500 as a proxy for the market.**
- x **C) not congruent with the CAPM, which does not support Lewis' assertion concerning the S&P 500 as a proxy for the market.**

Explanation

The provided standard deviations and covariance and the beta of stock A can be entered into the following relationship:

$\text{covariance}(A,B) = (\text{beta of A}) \times (\text{beta of B}) \times (\text{Variance of market})$ gives us

$$(0.3 \times 0.35 \times 0.40) = 0.042 = 1 \times (\text{beta of B}) \times (0.22 \times 0.22)$$

$$\text{beta of B} = 0.042 / 0.0484 = 0.868.$$

expected return of B = risk free rate + (beta of B) × (Market risk premium),

expected return of B = $0.03 + (0.868) \times (0.12 - 0.03) = 0.108 < 0.15$, which is the expected return she computed from her analysis. One explanation for this is that the S&P 500 is not a good proxy for the market portfolio. (Study Session 18, LOS 57.a,g)

Question #66 of 125

Question ID: 464308

Based upon the given information, can Wilson compose a portfolio with any one of the three stocks and Treasury bills that is more efficient than the S&P 500?

- x **A) Yes, stock A.**
- x **B) Yes, stock B.**
- ✓ **C) No, the S&P 500 is more efficient than any of the individual stocks.**

Explanation

To investigate this, Wilson can first rule out stocks A and C. Both of them have an expected return that is less than or equal to the S&P 500, but their standard deviations are higher. Wilson must perform some calculations to see if stock B is more efficient than the S&P 500. Wilson would first determine the portfolio weights that can make the expected return of the stock B and T-bill portfolio equal to the S&P 500 portfolio. By setting up $0.12 = w \times 0.15 + (1 - w) \times 0.03$ and solving for w, Wilson finds that a $(0.75 / 0.25)$ stock B/T-bill portfolio has the same expected return of 0.12. The standard deviation of that portfolio is $(0.75 \times 35\%) = 26.25\% > 24\%$ which is the standard deviation of the S&P 500. Thus, the portfolio using Stock B and Treasury bills is not more efficient than the S&P 500. (Study Session 18, LOS 57.b)

Question #67 of 125

Question ID: 464309

With regard to the capital allocation line (CAL), moving along the CAL above the point of the tangency portfolio represents:

- x **A) increasing risk exposure by being above the efficient frontier.**
- x **B) buying T-bills to reduce risk yet still maximize efficiency by being on the CAL.**
- ✓ **C) borrowing at the risk-free rate to be invested in more than 100% of the tangency portfolio.**

Explanation

Moving along the CAL above the tangency portfolio represents borrowing at the risk free rate (shorting T-bills) to invest in more than your original capital in the tangency portfolio. The CAL becomes the efficient frontier when the risk free asset is available to invest in. (Study Session 18, LOS 57.d)

Question #68 of 125

Question ID: 464310

Which of the following is *least likely* an assumption of the Capital Asset Pricing Model (CAPM)?

- ✓ **A) The distribution of investors' forecasts of a given asset's return is normal.**
- x **B) Capital markets are perfectly competitive and all assets are marketable.**
- x **C) Investors can borrow and lend at the risk-free rate.**

Explanation

The CAPM assumes that investors have the same forecast of a given asset's return. Thus, according to the required assumption, the distribution will not be normal because the variance of the forecasts is zero. (Study Session 18, LOS 57.e)

Question #69 of 125

Question ID: 464520

Michael Paul, a portfolio manager, is screening potential investments and suspects that an arbitrage opportunity may be available. The three portfolios that meet his screening criteria are detailed below:

<i>Portfolio</i>	<i>Expected Return</i>	<i>Beta</i>
A	12%	1.0
B	16%	1.3
C	8%	0.9

Which of the following portfolio combinations produces the highest return while maintaining a beta of 1.00?

	<u>Portfolio A</u>	<u>Portfolio B</u>	<u>Portfolio C</u>
x A) 25%	50%	25%	
x B) 50%	12%	38%	
✓ C) 100%	0%	0%	

Explanation

<i>Portfolio Weights</i>			<i>Expected Return</i>	<i>Beta</i>
<i>A</i>	<i>B</i>	<i>C</i>		
25%	50%	25%	13.00%	1.13
50%	12%	38%	10.96%	1.00

100%	0%	0%	12.00%	1.00
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Portfolio weights of 25%, 50%, and 25% yield the highest return, but at a beta of 1.13. Investing 100% in Portfolio A yields the highest return for this risk level (i.e., beta = 1.00).

Question #70 of 125

Question ID: 464424

Rachel Stephens, CFA, examines data for two computer stocks, AAA and BBB, and derives the following results:

- Standard deviation for AAA is 0.50.
- Standard deviation for BBB is 0.50.
- Standard deviation for the S&P500 is 0.20.
- Correlation between AAA and the S&P500 is 0.60.
- Beta for BBB is 1.00.

Stephens is asked to identify the stock that has the highest systematic risk and the stock that has the highest unsystematic risk. Stephens should draw the following conclusions:

<u>Highest Systematic Risk</u>	<u>Highest Unsystematic Risk</u>
✓ A) Stock AAA	Stock BBB
x B) Stock AAA	Stock AAA
x C) Stock BBB	Stock AAA

Explanation

First, compare the betas for the two stocks. The beta for AAA can be derived with the formula:

$$\beta_{AAA} = \frac{COV_{AAA,m}}{\sigma_m^2} = \frac{\rho_{AAA,m}\sigma_{AAA}}{\sigma_m} = \frac{(0.60)(0.50)}{0.20} = 1.50.$$

Therefore, AAA has larger beta and greater systematic risk than stock BBB which has a beta equal to 1. To assess the unsystematic risk, note that total risk is measured by the standard deviation. Note that the standard deviations for AAA and BBB are identical. Therefore, AAA and BBB have identical total risk. Moreover, note that:

total risk = systematic risk + unsystematic risk.

We have already concluded that both stocks have identical total risk and that AAA has greater systematic risk. Therefore, BBB must have higher unsystematic risk.

Question #71 of 125

Question ID: 464423

The security market line (SML) is a graphical representation of the relationship between return and:

- x **A) total risk.**
- x **B) unsystematic risk.**
- ✓ **C) systematic risk.**

Explanation

The SML graphically represents the relationship between return and systematic risk as measured by beta.

Question #72 of 125

Question ID: 464353

The slope of the capital allocation line is equal to:

- ☒ A) the inverse of the slope of the security market line.
- ☒ B) the expected return on the tangency portfolio divided by the standard deviation of the tangency portfolio.
- ☒ C) the expected risk premium on the tangency portfolio divided by the standard deviation of the tangency portfolio.

Explanation

Because the capital allocation line is a straight line, we can express it as the equation of a straight line ($y = mx + b$) where the dependent variable, y , is the expected return $E(R_p)$ and the independent variable, x , is the standard deviation σ_p :

$$E(R_p) = R_F + [(E(R_T) - R_F)/\sigma_T] \sigma_p$$

where:

$E(R_T)$ = the expected return on the tangency portfolio, T

σ_T = the standard deviation of the tangency portfolio, T

R_F = the risk-free return

The slope is equal to $[(E(R_T) - R_F)/\sigma_T]$, where $[E(R_T) - R_F]$ is the expected risk premium on the tangency portfolio.

Question #73 of 125

Question ID: 464563

Investors may be able earn a risk premium for holding dimensions of risk unrelated to market movements if:

- ☒ A) unsystematic risk can be diversified away in portfolios.
- ☒ B) the market is informationally efficient.
- ☒ C) there is more than one source of systematic risk.

Explanation

Multifactor models that have more than one source of systematic risk allow us to capture other dimensions of risk besides overall market risk. Investors with unique circumstances that differ from the average investor may want to hold portfolios tilted away from the market portfolio in order to hedge or speculate on factors like recession risk, interest rate risk or inflation risk. An investor with lower-than-average exposure to recession risk, for example, can earn a premium by creating greater-than-average exposure to the recession risk factor. In effect, he earns a risk premium determined by the average investor by taking on a risk he doesn't care about as much as the average investor does.

Question #74 of 125

Question ID: 464482

Examples of macroeconomic variables that create systematic risk include:

- ☐ A) variability in the growth of the money supply.
- ☐ B) changes in GDP growth rates.
- ☒ C) all of these choices are correct.

Explanation

Systematic risk factors are those variables that: (1) exhibit correlation with other variables and (2) explain the returns of many different assets. GDP growth and the money supply are each examples of systematic risk factors.

Question #75 of 125

Question ID: 464346

Portfolio Management Associates (PMA) provides asset allocation advice for pensions. PMA recommends that all their pension clients select an appropriate weighting of the risk-free asset and the market portfolio. PMA should explain to its clients that the market portfolio is selected because the market portfolio:

- ☐ A) maximizes return.
- ☐ B) maximizes return and minimizes risk.
- ☒ C) maximizes the Sharpe ratio.

Explanation

The risk and return coordinate for the market portfolio is the tangency point for the capital market line (CML). The CML has the steepest slope of any possible portfolio combination. The slope of the CML is the Sharpe ratio. Therefore, the Sharpe ratio is highest for the market portfolio.

Question #76 of 125

Question ID: 464555

Janice Barefoot, CFA, has managed a portfolio where she used the Dow Jones Industrial Average (DJIA) as a benchmark. In the past two years the average monthly return on her portfolio has been higher than that of the DJIA. To get a measure of active return per unit of active risk Barefoot should compute the:

- ☐ A) information ratio, which is the standard deviation of the differences between the portfolio and benchmark returns divided by the average of those differences.
- ☒ B) information ratio, which is the standard deviation of the differences between the portfolio and benchmark returns divided into the average of those differences.
- ☐ C) Sharpe ratio, which is the standard deviation of the differences between the portfolio and benchmark returns divided into the average of those differences.

Explanation

The information ratio is the measure of active return per unit of active risk. If we let $X = (\text{monthly portfolio return} - \text{the benchmark return})$, then the information ratio = (the average of X / the standard deviation of X). It is similar to the Sharpe ratio,

which defines the random variable Y as $Y = (\text{monthly portfolio return} - \text{the risk-free rate})$. The Sharpe ratio = $(\text{the average of } Y / \text{the standard deviation of the portfolio return}) = \text{the standard deviation of } Y \text{ if the risk-free rate is constant.}$

Question #77 of 125

Question ID: 464356

Adrian Jones is the portfolio manager for Asset Allocators, Inc., (AAI). Jones has decided to alter her framework of analysis. Previously, Jones made recommendations among efficient portfolios of risky assets only. Now, Jones has decided to make recommendations that include the risk-free asset. The efficient frontier for Jones has changed shape from a:

- ☐ A) curve to the thick curve.
- ☒ B) curve to a line.
- ☐ C) line to a curve.

Explanation

Initially, Jones selected only efficient portfolios comprising risky assets. Formally, Jones selected portfolios along the Markowitz efficient frontier (a curve). When Jones decided to add the risk-free asset, her efficient frontier changed from a curve (the Markowitz efficient frontier) to a line (the capital market line). The capital market line starts at the risk-free rate and extends along (tangent to) the Markowitz curve.

Question #78 of 125

Question ID: 464483

A two-stock portfolio consists of the following:

- The portfolio consists of stock of Green Company (portfolio weight 30%) and Blue Company (portfolio weight 70%).
- Green's expected return is 12%, Blue's is 8%.
- Interest rates are expected to be 6%.
- Oil prices are expected to rise 2%.
- The two-factor model for Green Company is $R(\text{green}) = 12\% - 0.5 F_{\text{int}} - 0.5 F_{\text{oil}} + e_{\text{green}}$
- The two-factor model for Blue Company is $R(\text{blue}) = 8\% + 0.8 F_{\text{int}} + 0.4 F_{\text{oil}} + e_{\text{blue}}$

If interest rates are actually 9% and oil prices do not rise, the return on the portfolio will be:

- ☐ A) 10.55%.
- ☒ B) 10.17%.
- ☐ C) 12.89%.

Explanation

$R(\text{green})$ is $[12 - (0.5 \times 3) - (0.5 \times (-2))] = 11.5\%$.

$R(\text{blue})$ is $[8 + (0.8 \times 3) + (0.4 \times (-2))] = 9.6\%$.

The portfolio return is $[(0.30)(11.5) + (0.70)(9.6)] = 10.17\%$.

Question #79 of 125

Question ID: 464387

Figment, Inc., stock has a beta of 1.0 and a forecast return of 14%. The expected return on the market portfolio is 14%, and the long-run inflationary expectation is 3%. Which of the following statements is *most* accurate? Figment, Inc.'s stock:

- ☐ A) valuation relative to the market cannot be determined.
- ☐ B) is overvalued.
- ☒ C) is properly valued.

Explanation

Since Figment, Inc.'s, stock has a beta equal to 1.0, then the expected return of this stock is equal to the expected return on the market portfolio, which also has a beta of 1.0. Since Figment's expected return is equal to its required return, the stock is properly valued.

Question #80 of 125

Question ID: 464422

How are the capital market line (CML) and the security market line (SML) similar?

- ☐ A) The CML and SML use the standard deviation as a risk measure.
- ☐ B) The CML and SML can be used to find the expected return of a portfolio.
- ☒ C) The market portfolio will plot directly on the CML and the SML.

Explanation

All portfolios will plot on the SML. The only portfolio that will plot on the CML is the market portfolio, because it is perfectly diversified.

Questions #81-86 of 125

Orb Trust (Orb) has historically leaned towards a passive management style of its portfolios. The only model that Orb's senior management has promoted in the past is the Capital Asset Pricing Model (CAPM). Now Orb's management has asked one of its analysts, Kevin McCracken, CFA, to investigate the use of the Arbitrage Pricing Theory model (APT).

McCracken has determined that a two-factor APT model is adequate where the factors are the sensitivity to changes in real GDP and changes in inflation. McCracken's analysis has led him to the conclusion that the factor risk premium for real GDP is 8 percent while the factor risk premium for inflation is 2 percent. He estimates for Orb's High Growth Fund that the sensitivities to these two factors are 1.25 and 1.5 respectively. Using his APT results, he computes the expected return of the fund. For comparison purposes, he then uses fundamental analysis to also compute the expected return of Orb's High Growth Fund. McCracken finds that the two estimates of the Orb High Growth Fund's expected return are equal.

McCracken asks a fellow analyst, Sue Kwon, to provide an estimate of the expected return of Orb's Large Cap Fund based upon fundamental analysis. Kwon, who manages the fund, says that the expected return is 8.5 percent above the risk-free rate. McCracken then applies the APT model to the Large Cap Fund. He finds that the sensitivities to real GDP and inflation are 0.75 and 1.25 respectively.

Kwon wants to learn more about the APT and discusses McCracken's results with him. McCracken says "the APT model is a variation of the CAPM." Kwon comments that "extending the CAPM to an APT framework must require additional

assumptions."

Craig Newland joins the conversation. Newland says that the APT really is just another ad hoc multifactor model. All a researcher needs to do to compose an APT model, according to Newland, is to find a few macroeconomic factors that are correlated with stock returns and do a simple linear regression for each asset. McCracken says that it really is not that easy. For one thing, according to McCracken, the coefficients in the APT have a different interpretation from that of a basic multifactor model.

McCracken's manager at Orb, Jay Stiles, asks McCracken to compose a portfolio that has a unit sensitivity to real GDP growth but is not affected by inflation. McCracken is confident in his APT estimates for the High Growth Fund and the Large Cap Fund. He then computes the sensitivities for a third fund, Orb's Utility Fund, which has sensitivities equal to 1.0 and 2.0 respectively. McCracken will use his APT results for these three funds to accomplish the task of creating a portfolio with a unit exposure to real GDP and no exposure to inflation. He calls the fund the "GDP Fund." Stiles says such a GDP Fund would be good for clients who are retirees who live off the steady income of their investments. McCracken says that the fund would be a good choice if upcoming supply-side macroeconomic policies of the government are successful.

Question #81 of 125

Question ID: 464488

McCracken's estimate of the expected return of Orb's High Growth Fund would be:

- ☐ A) the risk-free rate plus 10%.
- ☐ B) 10%.
- ☒ C) the risk-free rate plus 13%.

Explanation

The formula is: expected return = $R_F + 0.08 \times 1.25 + 0.02 \times 1.5 = R_F + 13\%$ (Study Session 18, LOS 57.j)

Question #82 of 125

Question ID: 464489

With respect to McCracken's APT model estimate of Orb's Large Cap Fund and the information Kwon provides, an arbitrage profit could:

- ☐ A) be earned by buying the Large Cap Fund and selling short the High Growth Fund.
- ☒ B) not be earned.
- ☐ C) be earned by buying the High Growth Fund and selling short the Large Cap Fund.

Explanation

Based on the sensitivities to real GDP and inflation of 0.75 and 1.25, McCracken would calculate the expected return for the Orb Large Cap Fund to be:

$$\text{expected return} = R_F + 0.08 \times 0.75 + 0.02 \times 1.25 = R_F + 8.5\%$$

Therefore, Kwon's fundamental analysis estimate is congruent with McCracken's APT estimate. If we assume that both Kwon's and McCracken's estimates of the return of Orb's High Growth Fund are accurate, then no arbitrage profit is possible. Had Kwon provided an estimate of the Orb Large Cap Fund's expected return that was less than 8.5 percent, for example, then we would consider selling that fund short and purchasing the High Growth Fund with the proceeds. (Study Session 18, LOS 57.l)

Question #83 of 125

Question ID: 464490

With respect to McCracken and Kwon's comments concerning the relationship of the APT to the CAPM:

- ✓ **A) McCracken is correct and Kwon is wrong.**
- ✗ **B) both McCracken and Kwon are wrong.**
- ✗ **C) Kwon is correct and McCracken is wrong.**

Explanation

McCracken is correct in saying the APT is a variation of the CAPM. Both the APT and the CAPM are equilibrium asset-pricing models. For example, both models assume there are no arbitrage opportunities available. The APT requires fewer (not more) assumptions, however, e.g., the APT does not assume all investors will hold the same portfolio and have the same expectations. (Study Session 18, LOS 57.n)

Question #84 of 125

Question ID: 464491

In the conversation between Newland and McCracken concerning the relationship of multifactor models in general and the APT:

- ✗ **A) Newland was correct and McCracken was wrong.**
- ✓ **B) McCracken was correct and Newland was wrong.**
- ✗ **C) they were both wrong.**

Explanation

The APT is a special case of a multifactor model. Two of the most important distinguishing characteristics are that the coefficients in the APT are **not** simply regression coefficients from a regression of returns over time on some factors that have been selected *ad hoc*. In the APT the coefficients are premiums for an asset's exposure to certain types of risk. Their values represent a no-arbitrage condition, which is an important assumption in the APT that a general multifactor model does not require. (Study Session 18, LOS 57.j)

Question #85 of 125

Question ID: 464492

The GDP Fund composed from the other three funds would have a weight in Utility Fund *equal* to:

- ✗ **A) 0.3.**
- ✗ **B) -3.2.**
- ✓ **C) -2.2.**

Explanation

In order to eliminate inflation, the following three equations must be solved simultaneously, where the GDP sensitivity will equal 1 in the first equation, inflation sensitivity will equal 0 in the second equation and the sum of the weights must equal 1 in the third equation.

1. $1.25w_x + 0.75w_y + 1.0w_z = 1$
2. $1.5w_x + 1.25w_y + 2.0w_z = 0$
3. $w_x + w_y + w_z = 1$

Here, "x" represents Orb's "High Growth Fund", "y" represents "Large Cap Fund" and "z" represents "Utility Fund." By multiplying equation 1 by 2.0 and subtracting equation 2 from the result, McCracken will get $w_x + 0.25w_y = 2$. McCracken can

also subtract equation 3 from equation 1 and get $0.25w_x - 0.25w_y = 0$. This means $w_x = w_y$. Thus, the equation $w_x + 0.25w_y = 2$ becomes $1.25w_y = 2$ and $w_y = w_x = 1.6$. It follows from any of the other equations that $w_z = -2.2$.

(Study Session 18, LOS 57.j)

Question #86 of 125

Question ID: 464493

With respect to the comments of Stiles and McCracken concerning for whom the GDP Fund would be appropriate:

- ☒ A) both were correct.
- ☒ B) McCracken was correct and Stiles was wrong.
- ☒ C) Stiles was correct and McCracken was wrong.

Explanation

Since retirees living off a steady income would be hurt by inflation, this portfolio would not be appropriate for them. Retirees would want a portfolio whose return is positively correlated with inflation, to preserve value, and less correlated with the variable growth of GDP. Thus, the fund would not be appropriate for retirees and Stiles is wrong. McCracken is correct in that supply side macroeconomic policies are generally designed to increase output at a minimum of inflationary pressure. Increased output would mean higher GDP, which in turn would increase returns of a fund positively correlated with GDP.

(Study Session 18, LOS 57.j)

Question #87 of 125

Question ID: 464511

Given a three-factor arbitrage pricing theory (APT) model, what is the expected return on the Premium Dividend Yield Fund?

- The factor risk premiums to factors 1, 2 and 3 are 8%, 12% and 5%, respectively.
- The fund has sensitivities to the factors 1, 2, and 3 of 2.0, 1.0 and 1.0, respectively.
- The risk-free rate is 3.0%.

- ☒ A) 50.0%.
- ☒ B) 33.0%.
- ☒ C) 36.0%.

Explanation

The expected return on the Premium Dividend Yield Fund is $3\% + (8.0\%)(2.0) + (12.0\%)(1.0) + (5.0\%)(1.0) = 36.0\%$.

Question #88 of 125

Question ID: 464441

The single-factor market model predicts that the covariance between two assets (asset i and asset j) is equal to:

- ☒ A) the beta of i times the beta of j divided by the standard deviation of the market portfolio.
- ☒ B) the beta of i times the beta of j.
- ☒ C) the beta of i times the beta of j times the variance of the market portfolio.

Explanation

One of the predictions of the single-factor market model is that $\text{Cov}(R_i, R_j) = \beta_i \beta_j \sigma_M^2$. In other words, the covariance between two assets is related to the betas of the two assets and the variance of the market portfolio.

Question #89 of 125

Question ID: 464553

A common strategy in bond portfolio management is *enhanced indexing by matching primary risk factors*. This strategy could be implemented by forming:

- ☐ A) a portfolio with asset portfolio weights equal to that of the index.
- ☐ B) a portfolio with factor sensitivities that sum to one.
- ☒ C) a portfolio with factor sensitivities equal to that of the index.

Explanation

Enhanced indexing by matching primary risk factors could be implemented by creating a tracking portfolio with the same factor sensitivities as the index but with a different set of bonds. Then any differences in performance between the portfolio and the benchmark index will be the result of bond selection ability and not from different exposures to macroeconomic factors like GDP, inflation, and interest rates.

Question #90 of 125

Question ID: 464557

A factor portfolio is a portfolio with:

- ☐ A) a specific set of factor sensitivities designed to replicate the factor exposures of a benchmark index.
- ☒ B) a factor sensitivity of one to a particular factor in a multi-factor model and zero to all other factors.
- ☐ C) factor sensitivities of zero to all factors, positive expected net cash flow, and an initial investment of zero.

Explanation

A factor portfolio is a portfolio with a factor sensitivity of one to a particular factor and zero to all other factors. An arbitrage portfolio is a portfolio with factor sensitivities of zero to all factors, positive expected net cash flow, and an initial investment of zero. A tracking portfolio is a portfolio with a specific set of factor sensitivities designed to replicate the factor exposures of a benchmark index.

Question #91 of 125

Question ID: 464425

Glimmer Glass has a correlation of 0.67 with the market portfolio, a variance of 23%, and an expected return of 14%. The

market portfolio has an expected return of 11% and a variance of 13%. Glimmer stock has approximately:

- ✓ **A) 11% less systematic risk than the average stock.**
- x **B) 19% more systematic risk than the average stock.**
- x **C) 4% more systematic risk than the average stock.**

Explanation

Beta is equal to the covariance divided by the market portfolio variance, or the product of the correlation and the ratio of the stock standard deviation to the market standard deviation. To derive the standard deviation, we take the square root of the variance. So $\beta = 0.67 \times 0.479583 / 0.360555 = 0.891183$. Glimmer's beta of 0.89 means that Glimmer stock has 89% of the systematic risk of the average stock, so Glimmer shares have about 11% less systematic risk than the average stock.

Question #92 of 125

Question ID: 464518

An arbitrage pricing theory (APT) model has the following characteristics:

- The risk free rate is 3.8%.
- Factor risk premiums are:
 - A. (7%)
 - B. (4%)
 - C. (2%)
 - D. (10%)

Assume Silver Linings Fund has the following sensitivities to the factors:

- Sensitivity to A is 0.5.
- Sensitivity to B is 1.2.
- Sensitivity to C is 2.1.
- Sensitivity to D is 0.2.

The expected return on the Silver Linings Fund is:

- ✓ **A) 18.3%.**
- x **B) 14.5%.**
- x **C) 20.1%.**

Explanation

$$E(R) = 3.8 + (0.5 \times 7) + (1.2 \times 4) + (2.1 \times 2) + (0.2 \times 10) = 18.3.$$

Question #93 of 125

Question ID: 464349

Consider an equally-weighted portfolio comprised of 17 assets in which the average asset standard deviation equals 0.69 and the average covariance equals 0.36. What is the variance of the portfolio?

- x **A) 37.5%.**

✓ **B) 36.7%.**

✗ **C) 32.1%.**

Explanation

Portfolio variance = $\sigma_p^2 = (1/n) \sigma_1^2 + [(n-1)/n] \text{cov} = [(1/17) \times 0.48] + [(16/17) \times 0.36] = 0.028 + 0.339 = 0.367 = 36.7\%$

Question #94 of 125

Question ID: 464465

Adjusted betas were developed in an effort to compensate for:

✓ **A) inaccurate forecasts for the efficient frontier based on traditional beta.**

✗ **B) the weaknesses of standard deviation as a risk measurement.**

✗ **C) traditional beta's limitations in assessing the risk of extremely volatile stocks.**

Explanation

Adjusted beta was developed to compensate for the beta instability problem, or the tendency of historical betas to generate inaccurate forecasts. Extreme volatility is not an issue; nor is standard deviation.

Question #95 of 125

Question ID: 464392

The market is expected to return 15% next year and the risk-free rate is 7%. What is the expected rate of return on a stock with a beta of 1.3?

✓ **A) 17.4.**

✗ **B) 17.1.**

✗ **C) 10.4.**

Explanation

$ER_{\text{stock}} = R_f + (ER_M - R_f) \text{Beta}_{\text{stock}}$

Question #96 of 125

Question ID: 464558

An analyst is constructing a portfolio for a new client. A portfolio which uses multifactor models to create a portfolio with an exposure to only one type of risk is:

✗ **A) a tracking portfolio.**

✓ **B) a factor portfolio.**

✗ **C) an efficient portfolio.**

Explanation

A factor portfolio is established to create exposure to a specific risk (i.e. inflation).

Question #97 of 125

Question ID: 464361

The capital market line (CML) is the capital allocation line with the:

- ✓ **A) market portfolio as the tangency portfolio.**
- ✗ **B) global minimum-variance portfolio as the tangency portfolio.**
- ✗ **C) market portfolio as the global minimum-variance portfolio.**

Explanation

The CML is the capital allocation line (CAL) with the market portfolio as the tangency portfolio.

Question #98 of 125

Question ID: 464362

Consider an equally-weighted portfolio comprised of seven assets in which the average asset variance equals 0.31 and the average covariance equals 0.27. What is the variance of the portfolio?

- ✗ **A) 27.00%.**
- ✗ **B) 24.16%.**
- ✓ **C) 27.5%.**

Explanation

Portfolio variance = $\sigma_p^2 = (1/n) \sigma^2_1 + [(n-1)/n] \text{cov} = [(1/7) \times 0.31] + [(6/7) \times 0.27] = 0.044 + 0.231 = 0.275 = 27.5\%$

Question #99 of 125

Question ID: 464333

Which of the portfolios represented in the table below are NOT efficient?

Portfolio	A	B	C	D	E	F	G	H
(R _p)	10%	12.5%	15%	16%	17%	18%	18%	20%
s _p	23%	21%	25%	29%	29%	32%	35%	45%

- ✗ **A) B, E, and F.**
- ✗ **B) B, D, and F.**
- ✓ **C) A, D, and G.**

Explanation

Relative to any other portfolio, an inefficient portfolio has greater risk at the same return (portfolio G), less return at the same level of risk (portfolio D), or less return and more risk (portfolio A).

Question #100 of 125

Question ID: 464443

Michael Carr and Karen Bocock are analysts for the Portfolio Optimization Group. Carr and Bocock are discussing the firm's mean variance optimization model for equity holdings and the pros and cons of using market model estimates or historical estimates as inputs to the model.

- Carr states, "One of the main concerns I have about the model is that whether we are using market model estimates or historical estimates, we are implicitly assuming that the historical relationship between the stock and the market is indicative of the future."
- Bocock replies, "One of the main advantages to using the market model estimates is the fact that there are fewer parameters to estimate."

With regard to their statements about methods for computing the inputs for a mean-optimization model:

- ✓ **A) both are correct.**
- ✗ **B) only one is correct.**
- ✗ **C) both are incorrect.**

Explanation

Carr's statement is correct. Using historical estimates and market model estimates both involve the implicit assumption that the historical relationship between a stock and the market is indicative of the future relationship. The historical estimate method uses direct historical means, variances, and correlations as inputs to the model. The market model method regresses historical returns against returns for the market and assumes that returns for each asset are correlated with returns to the market. Since both methods use some form of historical data, both assume that history is indicative of the future.

Bocock is also correct. The historical estimate method requires a large number of estimates, especially for computing the covariances between every stock in a portfolio. The market model estimate method simplifies the process significantly (resulting in fewer parameters) since all stock returns are assumed to be correlated with the market.

Question #101 of 125

Question ID: 464468

Analysts trying to compensate for instability in the efficient frontier are *least* concerned about:

- ✗ **A) uncertainty in the forecast of variances and returns.**
- ✓ **B) a sharp rise in earnings restatements.**
- ✗ **C) small changes in expected returns.**

Explanation

Small changes in expected returns can have a large effect on the efficient frontier - in some cases analysts or money managers will take actions to compensate for those effects. Uncertainty in forecasts is of paramount importance to analysts, since an accurate portrayal of the efficient frontier is impossible without accurate estimates. While historical data is often used to extrapolate future values, analysts realize the limitations of such data in forecasting. As such, changes to historical statistics, such as those caused by a flood of restatements, would be of some concern, but less than the other choices.

Question #102 of 125

Question ID: 464340

Which of the following statements regarding the risk-free asset is *least* accurate?

✓ A) The covariance of the risk-free asset with other assets is +1.

X B) Markowitz portfolio theory develops into capital market theory with the inclusion of a risk-free asset.

X C) The variance of the risk-free asset is zero.

Explanation

The risk-free rate is constant so it does not co-vary with other assets. Thus the covariance is zero.

Questions #103-108 of 125

Carrie Marcel, CFA, has long used the Capital Asset Pricing Model (CAPM) as an investment tool. Marcel has recently begun to appreciate the advantages of arbitrage pricing theory (APT). She used reliable techniques and data to create the following two-factor APT equation:

$$E(R_P) = 6.0\% + 12.0\%\beta_{P,\Delta GDP} - 3.0\%\beta_{P,\Delta INF}$$

Where ΔGDP is the change in GDP and ΔINF is the change in inflation. She then determines the sensitivities to the factors of three diversified portfolios that are available for investment as well as a benchmark index:

Portfolio	Sensitivity to ΔGDP	Sensitivity to ΔINF
Q	2.00	0.75
R	1.25	0.50
S	1.50	0.25
Benchmark Index	1.75	1.00

Marcel is investigating several strategies. She decides to determine how to create a portfolio from Q, R, and S that only has an exposure to ΔGDP . She also wishes to create a portfolio out of Q, R, and S that can replicate the benchmark. Marcel also believes that a hedge fund, which is composed of long and short positions, could be created with a portfolio that is equally weighted in Q, R, S and the benchmark index. The hedge fund would produce a return in excess of the risk-free return but would not have any risk.

Marcie Deiner is an investment manager with G&G Investment Corporation. She works with a variety of clients who differ in terms of experience, risk aversion and wealth. Deiner recently attended a seminar on multifactor analysis. Among other things, the seminar taught how the assumptions concerning the Arbitrage Pricing Theory (APT) model are different from those of the Capital Asset Pricing Model (CAPM). One of the examples used in the seminar is below.

$E(R_i) = R_f + f_1 B_{i,1} + f_2 B_{i,2} + f_3 B_{i,3}$, where: $f_1 = 3.0\%$, $f_2 = -40.0\%$, and $f_3 = 50.0\%$.

Beta estimates for Growth and Value funds for a three factor model			
	Factor 1	Factor 2	Factor 3
Betas for Growth	0.5	0.7	1.2
Betas for Value	0.2	1.8	0.6

Question #103 of 125

Question ID: 464522

Which of the following statements *least likely* describes characteristics of the APT and the CAPM?

- ☒ A) The APT is more flexible than the CAPM because it allows for multiple factors.
- ☒ B) Both models require the ability to invest in the market portfolio.
- ☒ C) Both models assume firm-specific risk can be diversified away.

Explanation

The CAPM can be thought of as a subset of the APT, multifactor model. Therefore, fewer assumptions are needed for the APT model than the CAPM. Although it could be included as a factor, the APT does not require an investment in the market portfolio. APT can be thought of as a k factor model, while the CAPM is based on the risk-free asset and the market portfolio. (LOS 57.e, I)

Question #104 of 125

Question ID: 464523

What is the APT expected return on a factor portfolio exposed only to ΔGDP ?

- ☒ A) 18.0%.
- ☒ B) 15.0%.
- ☒ C) 12.0%.

Explanation

A factor portfolio is a portfolio with a factor sensitivity of one to a particular factor and zero to all other factors. The expected return on a "factor 1" portfolio is $E(R_R) = 6.0\% + 12.0\% (1.00) - 3.0\%(0.00) = 18.0\%$. (LOS 57.I)

Question #105 of 125

Question ID: 464524

Which hedge fund portfolio strategy combination would eliminate exposure to changes in inflation, ΔINF , and result in the highest returns?

- ☒ A) Long 100.0% Portfolio Q and short 100.0% in both Portfolios R & S.
- ☒ B) Long 100.0% in both Portfolios R & S and short 100.0% Portfolio Q.
- ☒ C) Long 200.0% in Portfolio S and short 100.0% in Portfolio R.

Explanation

All three combinations neutralizes the changes in inflation but the long 200.0% Portfolio S and short 100.0% Portfolio R results in the highest return of the three as it has the highest exposure to changes in the GDP.

Long 100.0% Portfolios R & S and short 100.0% Portfolio Q

Position	Portfolio	Exposure	$\beta_{\Delta GDP}$	Net ΔGDP	$\beta_{\Delta INF}$	Net ΔINF	E(R)
Short	Q	-100.0%	2.00	-2.00	0.75	-0.75	-27.75%
Long	R	100.0%	1.25	1.25	0.50	0.50	19.50%
Long	S	100.0%	1.50	1.50	0.25	0.25	23.25%
				0.75		0.00	15.00%

Long 100.0% Portfolio Q and short 100.0% Portfolios R & S

Position	Portfolio	Exposure	$\beta_{\Delta GDP}$	Net ΔGDP	$\beta_{\Delta INF}$	Net ΔINF	E(R)
Long	Q	100.0%	2.00	2.00	0.75	0.75	27.75%
Short	R	-100.0%	1.25	-1.25	0.50	-0.50	-19.50%
Short	S	-100.0%	1.50	-1.50	0.25	-0.25	-23.25%
				-0.75		0.00	-3.00%

Long 200.0% Portfolio S and short 100.0% Portfolios R

Position	Portfolio	Exposure	$\beta_{\Delta GDP}$	Net ΔGDP	$\beta_{\Delta INF}$	Net ΔINF	E(R)
-	Q	0.0%	2.00	0.00	0.75	0.00	0.00%
Short	R	-100.0%	1.25	-1.25	0.50	-0.50	-19.50%
Long	S	200.0%	1.50	3.00	0.25	0.50	46.50%
				1.75		0.00	27.00%

(LOS 57.I)

Question #106 of 125

Question ID: 464525

Which hedge fund portfolio strategy combination of equally weighted short/long positions that provides an arbitrage opportunity?

- ✓ **A) Long 200.0% in Portfolio S and short 100.0% in Portfolio R.**
- x **B) Long 100.0% Portfolio Q and short 100.0% in both Portfolios R & S.**
- x **C) Long 100.0% in both Portfolios R & S and short 100.0% Portfolio Q.**

Explanation

All three combinations neutralizes the changes in inflation but the long 200.0% Portfolio S and short 100.0% Portfolio R results in the highest return of the three as it has the highest exposure to changes in the GDP.

Long 100.0% Portfolios R & S and short 100.0% Portfolio Q

Position	Portfolio	Exposure	$\beta_{\Delta GDP}$	Net ΔGDP	$\beta_{\Delta INF}$	Net ΔINF	E(R)
Short	Q	-100.0%	2.00	-2.00	0.75	-0.75	-27.75%
Long	R	100.0%	1.25	1.25	0.50	0.50	19.50%
Long	S	100.0%	1.50	1.50	0.25	0.25	23.25%
				0.75		0.00	15.00%

Long 100.0% Portfolio Q and short 100.0% Portfolios R & S

Position	Portfolio	Exposure	$\beta_{\Delta GDP}$	Net ΔGDP	$\beta_{\Delta INF}$	Net ΔINF	E(R)
Long	Q	100.0%	2.00	2.00	0.75	0.75	27.75%
Short	R	-100.0%	1.25	-1.25	0.50	-0.50	-19.50%
Short	S	-100.0%	1.50	-1.50	0.25	-0.25	-23.25%
				-0.75		0.00	-3.00%

Long 200.0% Portfolio S and short 100.0% Portfolios R

Position	Portfolio	Exposure	$\beta_{\Delta GDP}$	Net ΔGDP	$\beta_{\Delta INF}$	Net ΔINF	E(R)
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-	Q	0.0%	2.00	0.00	0.75	0.00	0.00%
Short	R	-100.0%	1.25	-1.25	0.50	-0.50	-19.50%
Long	S	200.0%	1.50	3.00	0.25	0.50	46.50%
				1.75		0.00	27.00%

(LOS 57.I)

Question #107 of 125

Question ID: 464526

For the model used as an example in the seminar, if the T-bill rate is 3.5%, what are the expected returns for the Growth and Value Funds?

$E(R_{\text{Growth}})$ $E(R_{\text{Value}})$

- ✓ **A) 37.0%** **-37.9%**
- x **B) 33.5%** **-41.4%**
- x **C) 3.1%** **-3.2%**

Explanation

$E(R_{\text{Growth}}) = 0.035 + 0.03(0.5) - 0.40(0.7) + 0.50(1.2) = 0.035 + 0.015 - 0.280 + 0.600 = 0.370$ or 37.0%

$E(R_{\text{Value}}) = 0.035 + 0.03(0.2) - 0.40(1.8) + 0.50(0.6) = 0.035 + 0.006 - 0.720 + 0.300 = -0.3790$ or -37.9%

(LOS 57.j)

Question #108 of 125

Question ID: 464527

Which of the following is *least likely* an assumption of the APT model?

- x **A) no arbitrage opportunities are available to investors because capital markets are perfectly competitive.**
- ✓ **B) asset returns are normally distributed.**
- x **C) a large number of available assets for investment allow investors to eliminate non-systematic risk through diversification.**

Explanation

It is not necessary to assume that asset returns are normally distributed. The Arbitrage Pricing Theory (APT) Model allows for different characteristics of return distributions to be captured by the factors in the model. The APT model also does not require the existence of a market portfolio that is mean-variance efficient. These assumptions are necessary for the Capital Asset Pricing Model (CAPM). The APT has three less restrictive assumptions:

1. Asset returns are explained by a k factor model.
2. No arbitrage opportunities exist for investors, because capital markets are perfectly competitive.
3. Investors can eliminate non-systematic or firm-specific risk through diversification.

(LOS 57.I)

Question #109 of 125

Question ID: 464334

The efficient frontier consists of portfolios that have:

- ☐ A) the minimum standard deviation for any given level of expected return.
- ☐ B) capital allocation lines with slopes greater than 1.0.
- ☒ C) the maximum expected return for any given standard deviation.

Explanation

The efficient frontier consists of (efficient) portfolios that have the maximum expected return for any given standard deviation. The efficient frontier starts at the global minimum-variance portfolio and continues above it on the minimum variance frontier. The minimum-variance frontier is the expected return-standard deviation combinations of the set of portfolios that have the *minimum variance for every given level of expected return*. Efficient portfolios can have capital allocation line (CAL) slopes less than 1.0. These slopes, however, will all be less than that of the CAL of the market portfolio (the capital market line).

Question #110 of 125

Question ID: 464314

An analyst has estimated the returns on a specific real estate asset for three economic scenarios: contraction, expansion, and normal. The probability distribution for the state of the economy and the real estate returns are in the accompanying table.

	State of the Economy		
	Contraction	Normal	Expansion
Probability	20%	65%	15%
Scenario return	-5%	15%	25%

The expected return on this real estate investment is approximately:

- ☒ A) 12.50%.
- ☐ B) 15.00%.
- ☐ C) 14.50%.

Explanation

The expected return is: $\text{Return} = 0.20(-5\%) + 0.65(15\%) + 0.15(25\%) = 12.50\%$.

Question #111 of 125

Question ID: 464501

Which of the following statements regarding the arbitrage pricing theory (APT) as compared to the capital asset pricing model (CAPM) is *least* accurate? APT:

- ☐ A) does not require that one of the risk factors is the market portfolio; unlike the CAPM.
- ☐ B) has fewer assumptions than CAPM.

✓ **C)** is often times thought of as a special case of the CAPM.

Explanation

The CAPM is often times thought of as a special case of the APT since CAPM has only one factor, the market portfolio.

Question #112 of 125

Question ID: 464337

When solving for the minimum-variance frontier for many assets, the constraint is:

- ✓ **A) portfolio weights must sum to one.**
- ✗ **B)** weighted-average expected asset returns must sum to expected portfolio return.
- ✗ **C)** weighted-average covariances must sum to zero.

Explanation

This is the second step in determining the minimum-variance frontier. For every expected return between the smallest and largest expected return, determine the single portfolio with the smallest variance. We assume that the portfolio weights add up to one (this is the constraint on the portfolio weights). This step requires expected returns, variances, and covariances to calculate expected return and variance of the portfolios.

Question #113 of 125

Question ID: 464504

Which of the following is NOT an underlying assumption of the arbitrage pricing theory (APT)?

- ✗ **A) There are a sufficient number of assets for investors to create diversified portfolios in which firm-specific risk is eliminated.**
- ✓ **B)** A market portfolio exists that contains all risky assets and is mean-variance efficient.
- ✗ **C)** Asset returns are described by a K factor model.

Explanation

The APT makes no assumption about a market portfolio.

Question #114 of 125

Question ID: 464417

The covariance between stock A and the market portfolio is 0.05634. The variance of the market is 0.04632. The beta of stock A is:

- ✗ **A) 0.0026.**
- ✓ **B) 1.2163.**
- ✗ **C) 0.8222.**

Explanation

Beta = $\text{Cov}(R_A, R_M) / \text{Var}(R_M) = 0.05634 / 0.04632 = 1.2163$.

Question #115 of 125

Question ID: 464505

Which of the following statements about multifactor models is *most accurate*? A multifactor model:

- ☐ A) has an intercept term equal to the risk-free rate.
- ☐ B) is a cross-sectional equilibrium pricing model that explains variation across assets' expected returns during a single time period.
- ☒ C) is a time-series regression that explains the variation in returns in one asset over time.

Explanation

The multifactor model is a time-series regression that explains variation in one asset. APT is a cross-sectional equilibrium pricing model that explains variation across assets. The intercept term in a macroeconomic factor model is the asset's expected return.

Question #116 of 125

Question ID: 464503

If the arbitrage pricing theory (APT) holds, it determines:

- ☒ A) the intercept term in a multi-factor model.
- ☐ B) factor sensitivities in a multi-factor model.
- ☐ C) the factor prices in a multi-factor model.

Explanation

One way to think about the relationship between the APT and multi-factor models is to recognize that the intercept term in a multi-factor model is the asset's expected return; the APT is an expected return model that tells us what that intercept should be.

Question #117 of 125

Question ID: 464552

Janice Barefoot, CFA, has been managing a portfolio for a client who has asked Barefoot to use the Dow Jones Industrial Average (DJIA) as a benchmark. In her second year, Barefoot used 29 of the 30 DJIA stocks. She selected a non-DJIA stock in the same industry as the omitted DJIA stock to replace that stock. Compared to the DJIA, Barefoot placed a lower weight on the communication stocks and a higher weight on the other stocks still in the portfolio. Over that year, the non-DJIA stock in the portfolio had a positive and higher return than the omitted DJIA stock. The communication stocks had a negative return while all of the other stocks had a positive return. The portfolio managed by Barefoot outperformed the DJIA. Based on this we can say that the return from factor tilts and asset selection were:

- ☒ A) both positive.
- ☐ B) positive and negative respectively.
- ☐ C) negative and positive respectively.

Explanation

Since the communications stocks had a negative return while all the other stocks had a positive return, Barefoot's underweighting of those stocks produced a positive tilt return. Since the asset chosen to replace the DJIA stock outperformed the omitted stock, the asset selection return was positive.

Question #118 of 125

Question ID: 464471

Which of the following statements concerning the macroeconomic multi-factor model for returns on stock j $\{R_j = 12\% + 1.4F_1 - 0.8F_2 + \epsilon_j\}$ is *least* accurate?

- ☐ A) F_1 and F_2 represent priced risk.
- ☒ B) The return on stock j will decrease as factor 2 is expected to increase.
- ☐ C) The expected return on stock j is 12%.

Explanation

In a macroeconomic multi-factor model, only *unexpected* changes in systematic factors are priced in the sense that they affect stock returns. The return on stock j will decrease only if factor 2 increases *unexpectedly* (because the factor sensitivity is less than zero). Expected increases will NOT cause stock j returns to decrease.

Question #119 of 125

Question ID: 464388

The market is expected to return 12% next year and the risk free rate is 6%. What is the expected rate of return on a stock with a beta of 0.9?

- ☐ A) 13.0.
- ☐ B) 10.8.
- ☒ C) 11.4.

Explanation

$$ER_{\text{stock}} = R_f + (ER_M - R_f) \text{Beta}_{\text{stock}}.$$

Question #120 of 125

Question ID: 464506

Which of the following *best* completes the following statement? The capital asset pricing model (CAPM) is:

- ☒ A) a subset of the arbitrage pricing theory (APT) model.
- ☐ B) a relatively easy model to implement and test.
- ☐ C) a useful model in calculating expected returns.

Explanation

The APT is less restrictive than the CAPM; it does not require the assumptions that investors have quadratic utility functions, security returns are normally distributed, or the existence of a mean variance efficient market portfolio. The CAPM is a subset of the APT where it

is assumed that only the relationship to the market portfolio is useful in explaining returns. The APT is more flexible because it can have k factors. However, these factors are not defined in theory.

Questions #121-122 of 125

Marcie Deiner is an investment manager with G&G Investment Corporation. She works with a variety of clients who differ in terms of experience, risk aversion and wealth. Deiner recently attended a seminar on multifactor analysis. Among other things, the seminar taught how the assumptions concerning the Arbitrage Pricing Theory (APT) model are different from those of the Capital Asset Pricing Model (CAPM). One of the examples used in the seminar is below.

$E(R_i) = R_f + f_1 B_{i,1} + f_2 B_{i,2} + f_3 B_{i,3}$. where: $f_1 = 3.0\%$, $f_2 = -40.0\%$, and $f_3 = 50.0\%$.

Beta estimates for Growth and Value funds for a three factor model			
	Factor 1	Factor 2	Factor 3
Betas for Growth	0.5	0.7	1.2
Betas for Value	0.2	1.8	0.6

Question #121 of 125

Question ID: 464509

For the model used as an example in the seminar, if the T-bill rate is 3.5%, what are the expected returns for the Growth and Value Funds?

$E(R_{\text{Growth}})$ $E(R_{\text{Value}})$

- ☒ A) 33.5% -41.4%
- ☒ B) 37.0% -37.9%
- ☒ C) 3.1% -3.16%

Explanation

$E(R_{\text{Growth}}) = 0.035 + 0.03(0.5) - 0.4(0.7) + 0.5(1.2) = 0.035 + 0.015 - 0.28 + 0.6 = 0.37$ or 37.0%

$E(R_{\text{Value}}) = 0.035 + 0.03(0.2) - 0.4(1.8) + 0.5(0.6) = 0.035 + 0.006 - 0.72 + 0.30 = -0.379$ or -37.9%

Question #122 of 125

Question ID: 464510

Which of the following is *least likely* an assumption of the APT model?

- ☒ A) asset returns are normally distributed.
- ☒ B) no arbitrage opportunities are available to investors because capital markets are perfectly competitive.
- ☒ C) a large number of available assets for investment allow investors to eliminate non-systematic risk through diversification.

Explanation

It is not necessary to assume that asset returns are normally distributed. The Arbitrage Pricing Theory (APT) Model allows for different characteristics of return distributions to be captured by the factors in the model. The APT model also does not require the existence of a market portfolio that is mean-variance efficient. These assumptions are necessary for the Capital Asset Pricing Model (CAPM). The APT has three less restrictive assumptions:

1. Asset returns are explained by a k factor model.
2. No arbitrage opportunities exist for investors, because capital markets are perfectly competitive.
3. Investors can eliminate non-systematic or firm-specific risk through diversification.

Question #123 of 125

Question ID: 464312

One of the assumptions of mean-variance analysis is that all investors are risk-averse, which means they:

- ☐ A) prefer less risk to more for any given level of volatility.
- ☒ B) prefer less risk to more for any given level of expected return.
- ☐ C) are not willing to make risky investments.

Explanation

In mean-variance analysis we assume that all investors are risk averse, which means they prefer less risk to more for any given level of expected return (NOT *for any given level of volatility*.) It does NOT mean that they are unwilling to take on *any* risk.

Question #124 of 125

Question ID: 464550

A portfolio manager uses a two-factor model to manage her portfolio. The two factors are confidence risk and time-horizon risk. If she wants to bet on an unexpected increase in the confidence risk factor (which has a positive risk premium), but hedge away her exposure to time-horizon risk (which has a negative risk premium), she should create a portfolio with a sensitivity of:

- ☒ A) 1.0 to the confidence risk factor and 0.0 to the time-horizon factor.
- ☐ B) 1.0 to the confidence risk factor and -1.0 to the time-horizon factor.
- ☐ C) -1.0 to the confidence risk factor and 1.0 to the time-horizon factor.

Explanation

She wants to create a confidence risk factor portfolio, which has a sensitivity of 1.0 to the confidence risk factor and 0.0 to the time horizon factor. Because the risk premium on the confidence risk factor is positive, an unexpected increase in this factor will increase the returns on her portfolio. The exposure to the time-horizon risk factor has been hedged away, because the sensitivity to that factor is zero.

Question #125 of 125

Question ID: 464396

Which of the following is NOT a prediction of the capital asset pricing model (CAPM)?

- ☐ **A) The market price of risk is the slope of the capital market line.**
- ☒ **B) All investors hold an equally weighted market portfolio of all assets.**
- ☐ **C) All investors identify the same risky tangency portfolio and combine it with the risk-free asset to create their own optimal portfolios.**

Explanation

The CAPM predicts that all investors hold the market portfolio - a portfolio in which each asset is held in proportion to its market value. This portfolio is value-weighted, not equally weighted. The capital allocation line is then the capital market line (CML) and the market price of risk is the slope of the CML. The security market line (SML) describes the relationship between asset risk and expected return, where risk is measured by beta.