

**Question #1 of 20**

Question ID: 1136686

A firm has determined that the value at risk (VaR) of its investment portfolio is \$18 million for one day at a 95% confidence level. Which of the following statements regarding this VaR measure is correct?

- A) There is a 95% probability that the portfolio will lose \$18 million on a given day.
- B) There is a 95% probability that the portfolio will lose no more than \$18 million on a given day.**
- C) There is a 5% probability that the portfolio will lose \$18 million on a given day.
- D) There is a 5% probability that the portfolio will lose no more than \$18 million on a given day.

Explanation

The VaR of this investment can be interpreted as either (1) there is a 95% probability that the portfolio will lose no more than \$18 million on a given day or (2) there is a 5% probability that the portfolio will lose more than \$18 million on a given day. (Module 1.1, LO 1.c)

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Question ID: 1254494

Northern Star (NS) is a financial institution that is heavily dependent on short-term interbank financing. NS fears that, due to its excessive exposure to low-quality assets, during a crisis its lenders may refuse to renew its credit lines. The risk faced by NS is described as:

- A) trading liquidity risk.
- B) funding liquidity risk.**
- C) business risk.
- D) reputation risk.

Explanation

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Question ID: 1254495

The board of directors of a financial institution have determined that the firm's operations could be further optimized in terms of effectiveness and efficiency. Which member(s) of the board would primarily be responsible for directly performing such optimization duties?

- A) Audit committee.**
- B) Compensation committee.
- C) Risk advisory director.
- D) Risk management committee.

Explanation

In addition to its usual duties relating to the firm's financial statements and regulatory reporting requirements, an audit committee could have duties related to optimizing the firm's operations in terms of effectiveness and efficiency.

B is incorrect. The compensation committee's role is to discuss and approve the remuneration of key management personnel. C is incorrect. The risk advisory director's role is to educate board members on best practices in both corporate governance and risk management as opposed to having duties to directly optimize the firm's operations. D is incorrect. The risk management committee within a financial institution is responsible for identifying, measuring, and monitoring financial risks as opposed to having duties to directly optimize a firm's operations.

(Book 1Module 3.2, LO 3.f)

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Question ID: 1254496

An analyst is examining a new fund that has the objective of mimicking the directional moves of the Rosedale Valley Index (RVI) but with 1.5 times the standard deviation of RVI. RVI has an expected return of 7%. The risk-free rate is 3% and the correlation between the new fund's returns and the returns of the index is 1. What is the expected return of the new fund using the capital asset pricing model (CAPM)?

- A) 6.0%.**
- B) 7.0%.
- C) 9.0%.
- D) 13.5%.

Explanation

Because the standard deviation of the new fund is 1.5 times that of the index, a correlation of 1 suggests that the beta of the new fund is a maximum of 1.5.

$$\text{Maximum } R_i = 0.03 + [1.5 \times (0.07 - 0.03)] = 0.09$$

A is incorrect. It omits the 0.03 in the first term. B is incorrect. It uses 1.0 as the beta instead of 1.5. D is incorrect. It omits the 0.03 in the brackets in the second term.

(Book 1Module 5.2, LO 5.e)

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Question ID: 1254497

The covariance of the return of Portfolio Z with the return of its benchmark is 0.0225. The standard deviation of the return of Portfolio Z is 13%, and the standard deviation of the return of benchmark is 14%. What is the beta of Portfolio Z?

- A) 0.95.
- B) 1.08.
- C) 1.15.
- D) 1.33.

Explanation

$$\beta_Z = \text{Cov}_{Z,B} / \sigma_B^2 = 0.0225 / 0.14^2 = 1.15$$

A is incorrect. It attempts to calculate beta as follows: $\text{Cov}_{Z,B} \times \sigma_Z / \sigma_B$. Beta would be correctly calculated by substituting $\rho_{Z,B}$ for $\text{Cov}_{Z,B}$ in that equation. B is incorrect. It is the ratio of the standard deviation of the return of the benchmark over the standard deviation of the return of Portfolio Z. D is incorrect. It uses the variance of the return of Portfolio Z in the denominator instead of the benchmark.

(Book 1Module 5.2, LO 5.f)

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Question ID: 1254498

Portfolio X has an expected return of 11% with a standard deviation of 18%. The beta of the portfolio is 1.2. The expected return on the market is 8% with a standard deviation of 14%. The risk-free rate is 2%. What is the Treynor measure of Portfolio X?

- A) 0.025.
- B) 0.075.
- C) 0.09.
- D) 0.50.

Explanation

The Treynor measure is calculated as $[(E(R_P) - R_F) / \beta_P] = (0.11 - 0.02) / 1.2 = 0.075$.

A is incorrect. It is the Jensen measure, calculated as $0.11 - [0.02 + (0.08 - 0.026)(1.2)] = 0.0252$, rounded to 0.025. C is incorrect. It is the Treynor measure using the market beta (1.0) in the denominator instead of the portfolio beta (1.2). D is incorrect. It is the Sharpe measure, calculated as $(0.11 - 0.02) / 0.18 = 0.50$.

(Book 1Module 5.3, LO 5.g)

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Question ID: 1254499

You have compiled the following information about a fund:

Information ratio	=	0.04918
Sortino ratio	=	0.4978
Tracking error	=	12.20%
Minimum acceptable return	=	5.20%
Benchmark return	=	14.80%
Risk-free	=	4.80%
Standard deviation of returns	=	27.98%

Based on this information, which of the following is correct?

- I. The return on the portfolio is 15.4%.
- II. The standard deviation below MAR is 20.49%.
- III. The Sharpe ratio is 0.87.

- A) I only.
- B) I and II.
- C) II and III.
- D) I, II, and III.

Explanation

IR = portfolio return – benchmark return / tracking error

$$0.049 = \frac{\text{portfolio return} - 0.148}{0.122}$$

$$0.04918 \times 0.122 = \text{portfolio return} - 0.148$$

$$0.006 + 0.148 = \text{portfolio return}$$

15.4% = portfolio return

Sortino ratio = (portfolio return – minimum acceptable return) / standard deviation below MAR

0.4978 = (15.4 – 5.2) / standard deviation below MAR

Standard deviation below MAR = 20.49%

Sharpe ratio = (portfolio return – risk-free) / standard deviation

Sharpe ratio = (15.4 – 4.8) / 27.98 = 0.379, so Statement III is incorrect

(Book 1Module 5.3, LO 5.g)

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Question ID: 1254500

In 1996, Fama and French developed a three-factor model to predict average stock returns. The high minus low (HML) factor in the model is:

- A) a value factor suggesting companies with high book-to-market ratios are more likely to be in financial distress.**
- B) a value factor suggesting that companies with low book-to-market ratios should have higher returns.
- C) a size factor suggesting smaller companies are more sensitive to the business cycle.
- D) a size factor suggesting that larger companies are safer investments.

Explanation

Fama-French has three factors: the market, SMB (size factor), and HML (value factor). HML means long high book-to-market (B/M) ratio companies, short low B/M ratio companies. The rationale is that high B/M ratio companies (i.e., value stocks) should have higher returns, possibly because they may be in financial distress and are therefore riskier. (Book 1Module 6.2, LO 6.f)

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Question ID: 1254501

The Metallgesellschaft Refining and Marketing (MGRM) case illustrates a financial disaster related to large unexpected market movements. Which of the following statements regarding risk management at MGRM is correct?

- A) MGRM used long-term futures to hedge.
- B) The drop in oil prices in 1993 resulted in losses on MGRM's customer contracts.

- C) MGRM's deliberate maturity mismatch between its short- and long-term positions was an economically sound strategy.**
- D)** Prior to closing out its positions in late 1993, MGRM's open position in unleaded gas positions was about equal to the average total trading volume per day.

Explanation

Over the life of a properly constructed hedge, the cash flows from the forward and futures contracts would balance out, provided that the hedging firm could withstand interim cash-flow requirements from marked-to-market losses, margin calls, credit risks, and liquidity risks associated with adverse market movements. Unfortunately for MGRM, its cash-flow problems did not allow it to ride out the hedge; it was forced to unwind its positions at very unfavorable terms.

A is incorrect. MGRM used *short-term* futures to hedge because alternatives in the forward market were unavailable and long-term futures contracts were highly illiquid. B is incorrect. The losses occurred on MGRM's long positions, which were realized immediately as the futures contracts were marked to market. The offsetting gains on the customer contracts could not be realized for years to come, which resulted in funding liquidity risk. D is incorrect. MGRM's open interest in unleaded gasoline contracts far exceeded average daily trading volume; its open interest was 55 million barrels in the fall of 1993, compared to an average trading volume of 15 to 30 million barrels per day.

(Book 1Module 9.1, LO 9.a)

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Question ID: 1254502

Nathan Petrelli is working on an overseas assignment in a country that has stricter securities laws and standards of ethical conduct than the GARP® Code of Conduct. Regarding this conflict between the GARP standards and the local standards, how should Petrelli proceed being an FRM holder?

- A) He must follow the local standards.**
- B)** He must follow the GARP Code of Conduct.
- C)** He can choose to follow the local standards or the GARP Code of Conduct.
- D)** He must allow his client to choose which standards his contract abides by.

Explanation

If there is a conflict between the GARP® Code of Conduct and the local standards, always follow the stricter standards. (Book 1Module 11.1, LO 11.a)

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Question ID: 1254503

The unconditional probability of the monetary authority increasing interest rates is 30%, and the unconditional probability of a recession is 25%. The probability of a recession given an increase in interest rates is 60%. What is the probability that either interest rates will increase or a recession will occur?

- A) 37%.
- B) 40%.
- C) 55%.
- D) 73%.

Explanation

The joint probability of a recession and an increase in interest rates is $0.3 \times 0.6 = 0.18$.

Given that $P(R) = 0.25$, $P(I) = 0.30$, and $P(RI) = 0.18$, computing $P(R \text{ or } I)$ is done as follows:

$$0.25 + 0.30 - 0.18 = 0.37$$

B is incorrect. It computes $P(RI)$ as $0.6 \times 0.25 = 0.15$. C is incorrect. It omits the third term completely. D is incorrect. It adds the 0.18 in the third term instead of subtracting it.

(Book 2Module 12.1, LO 12.b)

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Question ID: 1254504

An investment advisor is analyzing a specific mutual fund's long return history and has noticed an unusual clustering of returns in a small range for many years. In context of the probability distribution of the mutual fund's returns, which central moment should the investment advisor pursue in greater detail?

- A) Kurtosis.
- B) Mean.
- C) Skewness.
- D) Variance.

Explanation

Kurtosis refers to the degree of clustering in the data distribution.

B is incorrect. The mean is the expected value of the returns and does not specifically refer to clustering. C is incorrect. Skewness refers to the extent to which the distribution of data is not symmetric around its mean and does not specifically refer to clustering. D is incorrect. Variance measures the dispersion of data and does not specifically refer to clustering.

(Book 2Module 13.2, LO 13.c)

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Question ID: 1254505

The operations manager of a call center is analyzing the number of calls received per hour to assist in calculating the probability of a lull in calls as well as a flurry of calls. The average number of calls per hour is known and has been stable for quite some time. The data will be used to optimize staffing and scheduling. Which type of distribution would be of interest to the operations manager?

- A) Bernoulli distribution.
- B) Binomial distribution.
- C) Normal distribution.
- D) Poisson distribution.**

Explanation

The Poisson distribution looks at number of successes per hour (in this instance) as well as the average or expected number of successes per hour.

It is not a Bernoulli distribution nor a binomial distribution because those distributions would focus on whether there is a call or not as opposed to the number of calls in a given period. It is not a normal distribution because a normal distribution is used to model continuous variables. In this instance, the number of calls is a discrete variable.

(Book 2Module 14.1, LO 14.a)

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Question ID: 1254506

The following three-year annualized total returns represent a sample of all the managers at an investment firm: 8%, 13%, 2%, -3%, 10%. What is the sample standard deviation of the returns?

- A) 5.76%.
- B) 6.44%.**
- C) 33.20%.
- D) 41.50%.

Explanation

$$\text{Mean} = (8\% + 13\% + 2\% + (-3\%) + 10\%) / 5 = 6\%$$

$$\text{Sample variance} = [(8\% - 6\%)^2 + (13\% - 6\%)^2 + (2\% - 6\%)^2 + (-3\% - 6\%)^2 + (10\% - 6\%)^2] / (5 - 1) = 0.415\%$$

$$\text{Sample standard deviation} = (0.415\%)^{1/2} = 6.44\%$$

A is incorrect. It omits the "- 1" in the denominator. C is incorrect. It is the sample variance with the "- 1" omitted in the denominator. D is incorrect. It is the sample variance, not the sample standard deviation.

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Question ID: 1254507

You are analyzing the returns of two stocks assuming three possible states of the economy: boom, normal, or slow economic growth. You estimate the returns of two stocks assuming forecasted probabilities for each state, as shown here:

	Probability	Stock A Return	Stock B Return
Boom	0.20	0.22	0.28
Normal	0.30	0.16	0.10
Slow growth	0.50	0.05	0.01

What is the covariance of the returns for Stock A and Stock B?

- A) 0.006723.
- B) 0.007238.
- C) 0.008327.
- D) 0.245812.

Explanation

Step 1: Find the expected (mean) returns for each stock.

$E(R)_A = 0.2(0.22) + 0.30(0.16) + 0.50(0.05) = 0.117$

$E(R)_B = 0.2(0.28) + 0.30(0.10) + 0.50(0.01) = 0.091$

Step 2: Compute the covariance.

Event	Prob (P)	$P \times (R_A - E(R)_A) \times (R_B - E(R)_B)$
Boom	0.20	$0.2 (0.22 - 0.117) \times (0.28 - 0.091) = 0.0038934$
Normal	0.30	$0.30 (0.16 - 0.117) \times (0.10 - 0.091) = 0.0001161$
Slow	0.50	$0.50 (0.05 - 0.117) \times (0.01 - 0.091) = 0.0027135$
		Covariance = 0.006723

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Question ID: 1254508

A quantitative analyst has been asked to analyze performance data to determine whether to retain or fire investment managers. For a given sample size, if the analyst increases the significance level of the test, what happens to the probability of a type 1 error and the power of the test?

P (type 1 error)

Power of the test

- | | |
|---------------------|------------------|
| A) Decreases | Decreases |
| B) Decreases | Increases |
| C) Increases | Decreases |
| D) Increases | Increases |

Explanation

The probability of a type 1 error is the significance level of the test, so increasing the significance level will increase the probability of a type 1 error.

For a given sample size, increasing the probability of a type 1 error will decrease the probability of a type 2 error. The power of the test is one minus the probability of a type 2 error. Therefore, the power of the test increases when the significance level increases.

(Book 2Module 17.1, LO 17.c)

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Question ID: 1254509

You have performed a linear regression on 100 data points with three independent variables (A, B, and C) and have obtained the following data:

	Coefficients	Standard Error
Intercept	18.56	12.37
Variable A	−47.88	59.85
Variable B	625.22	385.94
Variable C	−52.90	18.89

Which of the following coefficients is statistically significant at the 95% confidence level?

- A) Intercept.
- B) Variable A.
- C) Variable B.
- D) **Variable C.**

Explanation

We need to work out the t -statistics and then compare them to the critical t -value for a 95% confidence level. Notice that 100 data points are a large sample, and we know that the t -statistics will be approximately 2 without looking up the table. If the computed t -statistics are higher than 2, we must conclude that the coefficients are significant.

t -statistic = coefficient / standard error

Intercept = $18.56 / 12.37 = 1.50$ (not significant)

Variable A = $-47.88 / 59.85 = -0.80$ (not significant)

Variable B = $625.22 / 385.94 = 1.62$ (not significant)

Variable C = $-52.90 / 18.89 = -2.80$ (significant)

(Book 2Module 18.3, LO 18.e)

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Question ID: 1254510

A quantitative analyst runs a regression of monthly value-stock returns on four independent variables over 72 months. The total sum of squares for the regression is 520 and the sum of squared errors is 150. What is the adjusted R^2 ?

- A) 67.14%.
- B) 69.43%.**
- C) 71.15%.
- D) 75.40%.

Explanation

$R^2 = (TSS - SSR) / TSS = (520 - 150) / 520 = 71.15\%$

Adjusted $R^2 = 1 - [(72 - 1) / (72 - 4 - 1)] \times (1 - 0.7115) = 69.43\%$

A is incorrect. It is calculated as $67 / 71 \times 0.7115 = 0.6714$. C is incorrect. It is simply the R^2 . D is incorrect. It is calculated as $71 / 67 \times 0.7115 = 0.7540$.

(Book 2Module 19.2, LO 19.c)

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Question ID: 1254511

A 30-month return series has a sample skewness and sample excess kurtosis of 0.25 and -0.85 , respectively. Which of the following most accurately describes the conclusion of a Jarque-Bera (JB) test that this series of returns

is normal? (The critical value for the JB statistic at the 5% significance level is 5.99.)

The JB statistic is given by the formula: $JB = (T - 1)[S^2 / 6 + (K^2 / 24)]$

The null hypothesis that the distribution is normal should:

- A) not be rejected because the test statistic is lower than the critical statistic.**
- B) be rejected because the test statistic is higher than the critical statistic.
- C) not be rejected because the test statistic is higher than the critical statistic.
- D) be rejected because the test statistic is lower than the critical statistic.

Explanation

$$JB = (29)\{(0.25)^2 / 6 + [(-0.85)^2 / 24]\} = 1.175.$$

The JB statistic is below the critical value of 5.99; hence, we do not reject the null hypothesis that the distribution is normal.

(Book 2Module 23.2, LO 23.d)

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Question ID: 1254512

An investment analyst runs a simulation to estimate the ending capital amount for an initial investment portfolio of \$2 million. The number of replications is initially 144, resulting in a mean ending capital of \$2.5 million and a standard deviation of \$300,000. She then reruns the previous simulation with 1,296 replications that result in the same mean ending capital of \$2.5 million and the standard deviation remains at \$300,000. As a result of rerunning the previous simulation, how much has the accuracy of the simulation changed?

- A) It has not changed.
- B) It has improved threefold.**
- C) It has improved ninefold.
- D) It has deteriorated threefold.

Explanation

$$\text{Standard error estimate (SEE) with 144 replications} = \$300,000 / (144)^{1/2} = \$25,000$$

$$\text{SEE with 1,296 replications} = \$300,000 / (1,296)^{1/2} = \$8,333$$

The SEE is now only one-third of the original amount (\$8,333 versus \$25,000). Therefore, increasing the number of scenarios ninefold (from 144 to 1,296), will increase the accuracy threefold.

(Book 2Module 24.1, LO 24.b)

