Midterm Exam
BUFN400—Financial Markets and Datasets—Fall 2022

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CSI 3118—October 26, 2022—2:00 p.m. to 3:15 p.m.

Label each of the following statements as TRUE, FALSE, or UNCERTAIN. For each statement, justify your answer with a few sentences or a brief paragraph.

Note that these statements may be inherently ambiguous, some statements may have no correct or incorrect answer, and there may be multiple issues to address in one statement. Your grade is based on how well you justify your answer, not on whether your answer is "right" or "wrong."

You should attempt to answer all questions. You have 75 minutes to complete the exam.

This is a sample exam with 5 questions. The actual exam will have 10 questions.

1. If R denotes the random gross return on a stock (e.g., 1.03 means a return of 3 percent), the random net return $R-1$ is always greater than the log return $\log R$.

2. Historical returns on the overall stock market have "fatter tails" than implied by a log-normal distribution.

3. When using linear regression of an asset's return on a market index to estimate the asset's alpha and beta, it is better to regress excess returns on excess returns than to regress returns on returns due to computational efficiency.

4. When plotting the cumulative return on a stock market index over 100 years, it is a good idea to use a log scale for the vertical axis because returns over long periods of time are likely to be positive.

5. To calculate OLS regression coefficients for the model $\mathbf{y} = \mathbf{Xb} + \boldsymbol{\epsilon}$, the computationally efficient solution $\hat{\mathbf{b}} = (\mathbf{X}^\top\mathbf{X})^{-1}\mathbf{X}^\top\mathbf{y}$ should be used when it is known that $\mathbf{X}$ is a matrix of full rank.