Dublin Business School

Excellence Through Learning

ASSIGNMENT THREE SPECIFICATION

Course: Msc in Financial Technology and Msc in Accounting and Finance
Module Title: Quantitative Financial Modelling

Module Code: B9FT101
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Assignment Date: 07-12-2023
Submission Date: 28-12-2023
Percentage of Total Grade: 20%
Group work

Instructions to student

1. All reports should be submitted to your subject/course page **on Moodle by the above date.**
2. It is your responsibility to ensure your file is uploaded correctly.
3. Students are required to retain a copy of each assignment.
4. When an assignment is submitted, it is the student's responsibility to ensure that the file is in the correct format and opens correctly.
5. Where the assignment is word processed it should be typed in MS Word, double-spaced, in Times New Roman, portrait page, size 12.
6. Assignments that exceed the word count will be penalised.
7. If the assignment is in another format please adhere to instructions from your lecturer.

8. Students should refer to the assessment regulations in their Course Guide.
9. DBS penalizes students who engage in academic impropriety (i.e. plagiarism, collusion and / or copying). Please refer to the referencing guidelines on Moodle for information on correct referencing.
10. All relevant provisions of the Assessment Regulations must be complied with. Penalties for late submission on assignments are as follows:
    25% penalty for assignments submitted *within5 working days* of the deadline.
    No marks for assignments submitted *more than 5 working days* after the deadline.
11. Extensions to assignment submission deadlines will be granted in exceptional circumstances only. The appropriate "*Application for Extension"* form must be used and supporting documentation (e.g. medical certificate) must be attached. Applications for extensions should be made directly to the Head of Year or Program Leade**r in advance** of the deadline date.

Note. When you submit your assignment, you will be asked to click on a button which will declare the following:

> By Submitting this assignment I confirm that I am aware of DBS policy regarding cheating, plagiarism and all other forms of academic impropriety. The coursework submitted is my own or my group's work, and all other sources consulted have been appropriately acknowledged. I am aware that in the case of doubt an investigation will be held.

12. Include an electronic **cover sheet** with the following details on the next page.

B9FT101

Quantitative Financial Modelling

CLASS ASSIGNMENT THREE

Valuation Principles | Mean Variance | Descriptive Statistics

Question 1: Portfolio construction

Calculate the following:
(i) Portfolio Expected return if the individual weightings are as follows:
x_1 (40%) and x_2 (60%) with ErX_1 = 6% and ErX_2 = 14.5%

(ii) Portfolio Risk if the individual weightings are
x_1 (40%) and x_2 (60%) with σX_1 = 12% and σX_2 = 30.5%
Correlation Coefficient is 0.11

(iii) Comment on the results and how you might improve the Portfolio risk-adjusted return

(iv) Comment on the important distinction between the conditional and the unconditional expectation of returns

(v) Explain the concept of mean reversion in the context of portfolio construction

Question 2: Valuation

Choose any asset with a cash-flow element to its payoff profile. You may choose any existing fixed income instrument, equity, or property for your analysis. You should pay particular attention to the construction of your discount rate and the assumptions embedded within.

Discuss your results in the context of the following key concepts discussed in class:

- Intrinsic value
- Margin of safety
- Opportunity cost

Part (c) General Descriptive Statistics

ABC Ltd. stock price has fluctuated over the last 12 months. The table below shows the variation in the monthly price of the stock between December 2021 and November 2022.

December	January	February	March	April	May	June	July	August	September	October	November
$245.00	$223.00	$213.00	$198.00	$185.00	$191.00	$176.00	$173.00	$188.00	$193.00	$177.00	$166.00

(i) Create a simple index for the data in the table above using June as the base period

(ii) Convert the price data in the table above into returns and calculate the Geometric mean of the series

(iii) If we assume that the annual risk-free rate is 2.5%, calculate the annualized Sharpe ratio

Part (d)

Write a brief "technical note" to your team outlining the key features and advantages of a Bayesian inference model. Pay particular attention to the implementation of Bayes theorem and the concept of conditional probability.

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Submission Date: 28th December 2023