

# Westminster Business School

**7FNCE041W**

**Computational Methods for Finance**

Individual Assessment (50%)

**Due 13:00 UK time @ 5th December 2023**

**Note: The coursework is currently undergoing external examination. This is the provisional coursework, which may be subject to changes.**

# A report on a Financial Derivative

You are required to prepare a report on a Financial Derivative you designed. The word limit is 2000 (excluding reference, appendix and python files). For the report you are required to include the following elements:

1. Having collected relevant **Data**
   1. Select one equity from FTSE100 with the two-year period.
   2. Use python to download its historical daily data via Yahoo Finance API, or download the .csv file from Yahoo Finance website and import it in Python.
   3. Plot the movement of the equity price over this time period and calculate its annualised average return and annualised standard deviation.
2. **Methodology**
   1. Design a non-dividend paying option and its associated pricing value using at least two methods which must be different. (Hint: regarding methods, you could use Binomial trees, Black-Sholes-Merton and Monte Carlo simulation etc.)
   2. You need to compare the results from these methods.
   3. The process must be implemented via Python.
3. **Analysis**
   1. Calculate and explain its Greeks for the risk management purpose.

Hints: you need to provide at least four Greeks

1. **Coding**
   1. Either uploading your code to GitHub and insert the hyperlink below your summary/abstract or including the snapshots of your codes in the appendix.
   2. Marks will be awarded for your Jupyter Notebook or Spyder with the annotations.
2. **Presentation**
   1. Word count provided on front page and does not exceed limit.
   2. No spelling, grammar, punctuation errors, and properly formatted showing a professional structure and appearance of your coursework.
   3. If needed, citations and references should be provided.

**Marking Scheme**

Your report should be structured as a management report and address the following objectives:

|  |  |
| --- | --- |
| **Component** | **Percentage** |
| **Data** | **20%** |
| **Methodology** | **40%** |
| **Analysis** | **20%** |
| **Coding** | **10%** |
| **Presentation** | **10%** |

Guidelines

• Present your review in a report format, answering all questions by adopting a professional approach

• Your report should be produced in pdf.

Python should be used for all calculations as necessary.

• To avoid Plagiarism, you must reference your work correctly, i.e any relevant information included must be correctly referenced by quoting paragraphs of any related work done by other authors (e.g. in journal articles and specialist textbooks etc), description of the derivative products and mechanics of how the security will achieve a desired result in a structured finance application.

• Your analysis should demonstrate an understanding of the underlying theory, its assumptions, limitations, and implementation in an applied context.

• Detailed coverage of both the theory and practice of derivative products is required. You will also be judged on your ability to make sound business and quantitative financial decisions based on your analysis.

**Please submit your completed work by 13:00 UK time on 5th December 2023.**

**Please submit in a pdf format via the Blackboard link.**

**Please do not forget insert your GitHub link.**

Text for Postgraduate modules

Submission of Coursework

All coursework on this module is submitted via Blackboard only. It will automatically be scanned through a text matching system (designed to check for possible plagiarism).

YOU MUST include your names and student IDs on the first page of your assignment.

To submit your assignment:

* Log on to Blackboard at http://learning.westminster.ac.uk;
* Go to the relevant module Blackboard site;
* Click on the ‘Submit Coursework’ link in the navigation menu on the left-hand side, as advised by the module teaching team;
* Click on the link for the relevant assignment;
* Follow the instructions.
* You will be given details by the module teaching team about how and when you will receive your marks and feedback on your work.

**REMEMBER**:

**It is a requirement that you submit your work in this way. All coursework must be submitted by 1PM on the due date. If you submit your coursework late but within 24 hours or one working day of the specified deadline, 10% of the overall marks available for that element of assessment will be deducted, as a penalty for late submission, except for work which is marked in the range 50 – 59%, in which case the mark will be capped at the pass mark (50%).**

**If you submit your coursework more than 24 hours or more than one working day after the specified deadline you will be given a mark of zero for the work in question.**

The University’s mitigating circumstances (MC) procedures relating to the non-submission or late submission of coursework apply to all coursework.