MScFE 600 FINANCIAL DATA

Group Work Project # 3

See grading rubric here.

Scenario

This project has gotten a lot of attention. The financing team wants to implement some of these ideas. Also, the risk management team is now involved and wants to make sure things stay on course. The financing and risk team have asked to implement 2 of the scenarios in working Python.

One scenario must be selected from:

1) Money at a fixed rate for an unsecured purchase (e.g. credit card) for an individual
2) Money at a floating rate for a secured purchase (e.g. home or automobile) for an individual
3) Money at a fixed rate for a business for a construction loan

The second scenario must be selected from

4) Publicly traded Equity (e.g. common stock)
5) Publicly traded bond (e.g. treasury bond, corporate bond)
6) An illiquid security – you choose the security

Tasks

In the first 2 GWPs, you focused on:

1) Collateral Related Risks: Financing & Collateral Related Risks: Credit 2) Statistical Related Risk: Volatility & Statistical Related Risk: Correlation 3) Magnifying Risk Factors: Leverage & Non-linearity
4) Frictional Risk Factors: Liquidity & Frictional Risk Factors: Regulation

Now it is time to focus on fallout!

Step 1: Fallout Risks

First, we'll start with fallout risks. Build a table with 6 rows (1 for each scenario) and 2 columns: 1 for model failures and 1 for financial crises. This will give a total of 12 boxes. Then for each box, describe either the challenges imposed by model failure or financial crises for each scenario. For example, let's consider Scenario 2, where the financial team is lending money to an individual for the purchase of a home. In this case, model failure could mean that MBS lack diversification due to similar factor exposures of the borrowers in each bucket. Similarly, crises could mean that the housing crash could force the lenders to foreclose and reclaim the homes, which are now worth much less than the money owed (e.g. underwater in real estate, or out-of-the-money in option lingo).

Step 2: Identifying Data

Thinking specifically about model failure and crises, produce a list of the data series you want to collect. You do not need to think of the data within each scenario. Rather than thinking about this along each scenario, think about the data you would collect that could work across all the scenarios!

You can still identify the data you choose with the same list of characteristics:

1) Data Type: Asset, Accounting, Economic, Ratings, Factor, …
2) Data Processing: Raw prices / yields; Levels / Categories; Returns; Implied Volatilities, …
3) Data Frequency: High-Frequency, Intraday, Daily, Weekly, Quarterly, Annually, …
4) Data Class: Equity, FX, Crypto, Fixed Income, Credit, Commodity, Derivatives, Real Estate, …
5) Data Source: Exchanges, OTC, Brokers, Dealers, Audited Financials, Vendors, Analytics Companies
6) Data Variety: Trade Data vs Quote Data; Actual Data vs Estimated Data; Observed Data vs Modeled Data; Adjusted Data vs Unadjusted; Absolute Data vs Relative Data, etc.

Step 3. Ethical Considerations based on Fallout

Model failure and crises are serious business. Some of the problems stem from behavioral biases. For example, if an expert claims that a model works, people are likely to believe it, even though the empirical evidence may say otherwise. This can be true for long-standing models, models that have won their creators Nobel Prizes, models from widely published and richly-cited professors, etc.

Our concern here is ethical considerations. Create another table with your 6 scenarios and 2 columns. This time, the columns will have the titles "create a 2ndtable, also with 6 rows (1 for each scenario) and 2 columns: 1 for ethical challenges and 1 for undesirable results. Again, this gives a total of 12 boxes. Again, for each box, describe the ethical challenges in the first column, and the undesirable challenges in the second box.

For example, let's consider Scenario 2. A borrower may want a loan to buy a house so that they can potentially achieve upside gain, but avoid downside accountability. For example, if the home value goes up, the borrower can sell the house for more than they paid, repay the lender, and profit from the difference. On the other hand, if the home value goes down, the borrower can walk away from the loan. There is an ethical problem. The undesirable result is massive speculation.

Step 4. Ethical Considerations based on Data

In GWP1 and GWP2, as well as in a previous step, you identified data series. Now select 3 of the 6 scenarios and identify the ethical considerations associated with the data. These considerations are detailed in Module 7 of the notes.

For each scenario you choose, list the ethical challenges, and propose some best practices that might delay, minimize, or avoid these problems from occurring in the first place.

Step 5. Implementation

Write Python code that allows the financing team to enact 1 of the money lending scenarios.

Draw a workflow diagram that shows the information they need, and then provide the customer.

Include a 1-page writeup (500 words) that summarizes how the risks are managed. The audience for this paper is the risk management team. Be very specific!

Step 6 (Not needed for groups of 2).

Write Python code that allows the financing team to enact 1 of the security lending scenarios.

Draw a workflow diagram that shows the information they need, and then provide the customer.

Include a 1-page writeup that summarizes how the risks are managed – again for the risk management team.

Submission requirements and format

One team member submits on behalf of the entire group the following items:

1. **1 PDF document*** with individual answers from steps 1, 2, 3, 4, and 6. a. Use the available Report Template and fill out the required information on the first page
2. A **zipped folder** including:
    a. .ibynb executable Jupyter notebook**
    b. 1 PDF document **with the output** from the Jupyter notebook. To include the output, RUN the code before downloading the PDF.

** **Use Google Docs to collaborate**. Start by uploading the Report Template provided in the Course Overview. Once your report is completed, click File → Download → PDF Document (.pdf) to obtain the copy for your submission.*

*** **Use Google Colab or GitHub to collaborate** *in completing the executable Python program.*

*The PDF file with your report must be uploaded **separately** from the zipped folder that includes any other types of files. This allows Turnitin to generate a similarity report.*

Rubric

Your instructor will evaluate your group submission for GPW3 using the following rubric:

The group is able to apply results, formulas, and their knowledge of theory to real-life finance scenarios by doing the following: ● Providing all the necessary information to support their arguments. ● Presenting arguments that reflect group discussion and research. ● Using authoritative references to support a position and provide updated information ● Concluding with practical takeaways for more insightful financial decision-making	Technical Reports contain 3 parts: 1) summary of key results; 2) interpretation of results; and 3) the recommended course of action that can reasonably follow from those results and interpretations. **Note**: Technical reports will include the technicalities of models, such as names, methods of estimation, parameter values, etc. and exclude generalities about the work done. It should NOT include the names of Python code that was used. Non-technical Reports contain 3 parts: 1) clear explanation of results; 2) the recommended course of action that follows; and 3) the identification of factors that impact each portfolio. **Note**: AVOID all references to model names, algorithms, unnecessary details, and focus on the investment decision.	A submission that looks professional should include: ● The axes labels and scales in graphs. ● No significant grammar errors or typos. ● Organized, clear structure, and easy to read document. ● Proper citations and bibliography using MLA format.

