

MScFE 600 FINANCIAL DATA

Group Work Project # 3

[See grading rubric here.](#)

Scenario

As you progress through this master's program, you will encounter some familiar themes. These themes appear again and again, regardless of the trading side (buy side vs. sell side), the type of market (exchange vs. over-the-counter), the type of product (spot vs. derivative), or the role you have (structuring, pricing, trading, hedging).

Being a financial engineer requires more than just learning concepts or finding Python code to implement. Throughout this program, you'll have opportunities to apply your hard-earned knowledge and skills to solve financial problems. Every hat you'll wear as a financial engineer will address some, if not all, of these problems at some point.

The themes are the following:

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
5. Fallout: Model Failure & Crises

Your group will pick one set (WHICH IS 2 THEMES!) and create a Jupyter notebook that details:

- 1) concepts explained in words
- 2) concepts explained using at least two asset classes with real-world data
- 3) concepts explained using real-world applications.

Tasks

Step 1. Pick 1 of the 5 themes (Collateral, Statistical, Magnifying, Frictional, Fallout) Factors

Step 2. Create a Jupyter notebook with 3 macro sections

Step 3. In Section 1, (2-3 pages), include definitions, equations, formulas, and diagrams that illustrate the ideas from your category. THERE IS NO CODE IN THIS SECTION.

Step 4. In Section 2, (2-4 pages), illustrate what you wrote about with original examples using real-world data. Your group will import historical datasets. The asset class, frequency, and country are all choices your group makes.

Step 5: Show side-by-side graphs that illustrate the presence and absence of the item.

For example, if you were illustrating 'hot' vs. 'cold,' you could graph the average temperature in two different places that are hot and cold. Your time series plot or barplot or histogram of temperature distributions would show how one type of data illustrates hot, and the other type of data illustrates cold.

Step 6: Using research papers or financial newspapers (NOT WIKIPEDIA), in 2 to 3 pages, summarize concepts explained using real-world applications. This is different from the previous examples because it doesn't require specific datasets, it does NOT require coding, and it should NOT be an original example, but it should be from a serious reference such as a journal article or reputable news source. For example, you could discuss different types of financial crises by illustrating the graph in this article ["Economic Realities and Consequences of the COVID-19 Pandemic – Part 1: Financial Markets and Monetary Policy"](#).

Submission requirements and format

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

1. 1 PDF paper* of approximately 10-12 pages, double-spaced, including sections from steps 3, 4, and 6. The paper should include the equations, and graphs from step 5. It must also include citations and references
 - a. Use the available Report Template and fill out the required information on the first page

2. A **zipped folder** including:
 - a. .ipynb executable Jupyter notebook** (Step 2)
 - 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.*

References

Martin, Fernando. “Economic Realities and Consequences of the COVID-19 Pandemic -- Part 1: Financial Markets and Monetary Policy | St. Louis Fed.” *Economic Research Federal Reserve Bank of St. Louis*, 30 Mar. 2020,
<https://research.stlouisfed.org/publications/economic-synopses/2020/03/30/economic-realities-and-sequences-of-the-covid-19-pandemicpart-i-financial-markets-and-monetary-policy>

Rubric

Your instructor will evaluate your group submission for GPW1 using the following rubric:

Quantitative Analysis (open-ended questions)	Technical and Non-technical Reports	Writing and Formatting
40 Points	30 Points	20 Points
<p>The group is able to apply results, formulas, and their knowledge of theory to real-life finance scenarios by doing the following:</p> <ul style="list-style-type: none"> • 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 	<p>Technical Reports contain 3 parts:</p> <ol style="list-style-type: none"> 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. <p>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.</p>	<p>A submission that looks professional should include:</p> <ul style="list-style-type: none"> • 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.
	<p>Non-technical Reports contain 3 parts:</p> <ol style="list-style-type: none"> 1) clear explanation of results; 2) the recommended course of action that follows; and 3) the identification of factors that impact each portfolio. <p>Note: AVOID all references to model names, algorithms, unnecessary details, and focus on the investment decision.</p>	