1st Assignment

Assignment Title:
International transmission and predictability of asset price volatility
Submission deadline: April 22nd, 2024

SUMMARY:
You are required to produce a report on the international transmission and predictability of asset price volatility for a particular asset of your choice.

REQUIREMENTS:
Your report must fulfil the following specific tasks:

Part A (80% of the total mark) – Model estimation:

1. Decide on the asset that will be your variable of interest, as well as, another asset that will be your predictive variable.
2. Collect daily price data for both assets for a period of 10 years.
3. Calculate the monthly annualised volatility for both assets.
4. Collect monthly data for any other relevant variables which might be essential for your report.
5. Estimate your chosen model to evaluate the impact of one asset's volatility on the asset volatility of your variable of interest.
6. Write a report analyzing the findings of your research. You are required to demonstrate a logical and coherent interpretation of theory and research findings, illustrating your arguments with appropriate diagrams where necessary.

NOTE: Avoid using firm-level or sector-level data and concentrate on country-level or global data.

The report must include the following sections: (i) Introduction (10 marks), (ii) Brief review of the literature (20 marks), (iii) Analysis of Data and Justification of Research Method (20 marks), (iv) Empirical Findings and their Interpretations (40 marks), (v) Conclusions, Recommendations and Harvard-style Reference list (10 marks).

The length of the **Part A report is 2000 words**. You will need to submit the report in a word document along with an excel file with your data.

Below you can find some papers that you could take ideas from for your report:

Ahmed, A. D., & Huo, R. (2021). Volatility transmissions across international oil market, commodity futures and stock markets: Empirical evidence from China. Energy Economics, 93, 104741.

Antonakakis, N., Cunado, J., Filis, G., Gabauer, D., & de Gracia, F. P. (2023). Dynamic connectedness among the implied volatilities of oil prices and financial assets: New evidence of the COVID-19 pandemic. International Review of Economics & Finance, 83, 114-123.

Farid, S., Kayani, G. M., Naeem, M. A., & Shahzad, S. J. H. (2021). Intraday volatility transmission among precious metals, energy and stocks during the COVID-19 pandemic. Resources Policy, 72, 102101.

Umar, Z., Gubareva, M., Naeem, M., & Akhter, A. (2021). Return and volatility transmission between oil price shocks and agricultural commodities. PLoS One, 16(2), e0246886.

Yang, J., & Zhou, Y. (2020). Return and volatility transmission between China's and international crude oil futures markets: A first look. Journal of Futures Markets, 40(6), 860-884.

Part B (20% of the total mark) - Forecasting:

- Split your data period from Part A into the first 100 observations for your training period (in-sample period) and the remaining 20 for your out-of-sample forecasting period.
- Estimate an AR model for your chosen asset volatility and use a rolling window (with a fixed window length) and direct forecasting strategy to generate out-of-sample forecasts for up to 3-months ahead. The AR model is your naïve model.
- Next, estimate an AR-X type model (where X will be the second asset volatility that you have chosen) and generate out-of-sample forecasts for up to 3-steps ahead.
- Choose two statistical loss-functions to evaluate your volatility forecasts based on the AR and AR-X models, for each step-ahead (1-, 2- and 3-steps ahead).
- Write a short report of **500 words** analyzing the findings of your research. You are required to demonstrate a logical and coherent interpretation of your forecasting findings, illustrating your arguments with appropriate diagrams, where necessary.

Below you can find some papers that you could take ideas from for your report:

Bonnier, J. B. (2022). Forecasting crude oil volatility with exogenous predictors: As good as it GETS?. Energy Economics, 111, 106059.

Degiannakis, S., & Filis, G. (2017). Forecasting oil price realized volatility using information channels from other asset classes. Journal of International Money and Finance, 76, 28-49.

Degiannakis, S., & Filis, G. (2022). Oil price volatility forecasts: What do investors need to know?. Journal of International Money and Finance, 123, 102594.

Liu, G., & Guo, X. (2022). Forecasting stock market volatility using commodity futures volatility information. Resources Policy, 75, 102481.

Zhang, F., & Zhang, Z. (2022). Forecasting exchange rate markets' volatility of G7 countries: will stock market volatility help?. Applied Economics Letters, 1-9.