ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA
DEPARTMENT OF ECONOMICS

Econometrics of Financial Markets (LMAEM)

October 2025

Using the dataset assigned to your profile, that can be downloaded from the web site of Econometrics of Financial Markets on Virtuale, solve the following three exercises. The delivery has been fixed on October 25th (Saturday), before 10:00 a.m. A **UNIQUE** pdf file (called "your surname"_"your name") with solutions, comments, and an Appendix with the *gretl* (or any alternative software) analysis, must be sent via email to my address e.bacchiocchi@unibo.it before that date. All solutions and comments **MUST** be contained in the first three pages of the document. In correcting the exam, I will consider the comments and solutions contained in the first three pages.

Important: The exercises must be solved individually. Too much similar works, as well as works done using ChatGPT or any other AI tool (I can easily check for this) will be STRONGLY penalized.

1. Consider the time series collected in the first worksheet (Foglio1) of the excel file assigned to your profile. The time series represents the log of the price of a financial asset. Provide a suitable investigation of the time-varying volatility associated to the returns of the financial asset.

2. Let the data in the second worksheet (Foglio2) of the excel file be indicators of the dynamics of the price levels of three financial assets. Using appropriate methodologies, investigate to what extent the financial returns follow interconnected and time-varying volatility paths over time.

1. Suppose to be interested in the dynamic impact of oil price shocks on some macroeconomic variables in a "small open economy". Consider the following vector of variables $y_t = (oil_t, infl_t, growth_t)'$, where oil_t is the oil price (in domestic currency), $infl_t$ is the inflation rate (growth rate of the consumer price index), and $growth_t$ is the growth rate of the gross domestic product. Using the three series reported in the third worksheet of the excel file (Foglio3), specify and estimate a VAR model and discuss the propagation mechanism of oil price shocks by calculating appropriate structural impulse response functions.

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