Coursework: Forecasting Oil Prices (30%, Group)

2025 Financial Econometrics

Imperial College Business School
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Deadline: Wednesday 19 February 2025, 3pm. (Submit both your report and your data/programme files)

1. Coursework

The purpose of this assignment is to apply econometric methods to forecast the returns on oil futures using historical data. You will need to construct a forecasting model, evaluate its predictive accuracy, and provide an economic interpretation of your findings. The main variables of interest for forecasting are CL1 (the front month crude oil futures contract price) and CL2 (the second month crude oil futures contract price).

2. Data

The data for this exercise will be provided on Isendi in a file called "Oil Data.xlsx".

3. Grading Criteria

A good coursework

- Has a clear structure. It is written in an academic style, but at the same time is written with the target audience (an oil trader looking to make money of oil futures) in mind.
- has a clear introduction; clearly presents the research question at hand; and makes the key results easy to understand by a busy professional;
- clearly explains the data and the methodology used;
- presents the results in a clear and intuitive way and provides a good interpretation of the results;
- should be readable by an intelligent non-expert with a grounding in economics/finance.

4. Hints

- Carefully consider what variable is best to forecast; should you forecast CL1, the returns of CL1 or the spread (CL2 – CL1). Why does it matter which variable you choose to forecast?
- Consider the frequency of the data; are you going to forecast daily, weekly or monthly? How do you deal with independent variables that have a lower frequency?
- There are various approaches you can take in this assignment, depending how comfortable you feel with econometrics. Some valid approaches include:
  1. Estimate an ARIMA or VAR as the basis of your forecasting model
  2. Estimate a predictive regression of the form

$$y_{t+1} = \alpha + \beta_1 x_t \ldots + \beta_k x_t + e_t$$

- Consider how you are going to measure out of sample performance. You probably want to hold back part of your sample for out-of-sample performance checks.
- If you are happy with your forecast, see if you can try to derive a trading rule from the forecast rule you built.
- Consider carefully how you present your results in a way that make sense to an audience of finance professionals. They likely know the industry well, but may not be very technical.