

N1611 Financial Econometrics – Coursework

2024-25

Coursework Guidelines

This is the coursework assignment for N1611 Financial Econometrics, and it is worth 30% of the total mark for the module.

The coursework consists of an understanding of theoretical models, along with data manipulation, analysis and interpretation. Please note that this is NOT a group assignment. The analysis and discussion of the coursework must be undertaken and written individually. You may receive reduced or no marks if there are strong similarities between the work submitted by two or more people.

Candidates should attempt ALL questions.

Your answer to each question should INCLUDE the full references of the articles, books and other sources cited. You may provide the references at the end of your answers and discussion for all questions.

Information on where to find the material: The material to be used in answering the questions is on the Canvas site. However, students are expected to do their own research and are encouraged to add other sources.

STATA output should NOT be copied and pasted directly into the project. You should present your results (e.g., regression output) as they would appear in published academic research papers. (Take a look at some published journal articles --sometimes the output is presented in tables, sometimes presented as estimated equations with s.e./t-statistics/p-values in parentheses under the corresponding coefficient, together with appropriate diagnostic statistics and their p-values).

You should always comment on your estimation results, i.e., what is the intuition behind your empirical findings.

The word count of the project must be printed on the first page of the coursework. The **maximum word count** is **1500**, e.g., this word count would be split across the questions. Tables, references and appendices are not included in the word count.

Note that your coursework must be submitted electronically via Canvas. Please check the **deadline** for submitting your work on the Canvas module site (under the "Assignments" section). For more information about the deadline or any issues about submitting your work, please contact the UG School Office (at this email:

Business-accountingfinance@sussex.ac.uk).

Upload your word (or pdf) document through the "E-submissions" link on the module's Canvas site by the deadline. There is no need to upload or submit the data or STATA estimation file.

Late submissions will be dealt with in accordance with university regulations. More information on assessment regulations can be found at the following link:

<http://www.sussex.ac.uk/adqe/standards/examsandassessment/esubmission>

Coursework Questions

You are given monthly data for the UK House Price Index (HPI) over the period from January 2011 to July 2024. The data file name is "HPI.xls", which is uploaded to Canvas along with this file. First, calculate the UK house price growth rate, i.e., $\Delta hpi_t = hpi_t - hpi_{t-1}$, where hpi_t is the natural logarithm of the HPI at time t and Δ is the first difference operator. Then:

- a) Explain the Box-Jenkins approach to building an ARMA(p, q) model for the house price growth rate series Δhpi_t .
[25%]
- b) Use the full sample period to obtain a graph of the Δhpi_t series. Based on the graph, does the series appear to be stationary? Comment on the behaviour of this series over time.
[10%]
- c) Explain the terms autocorrelation function (ACF) and partial autocorrelation function (PACF). What shape would these two functions take for a stationary autoregressive process, a moving average process, and an autoregressive moving average process?
[10%]
- d) Identify the appropriate models that you would estimate for the Δhpi_t series based on a sample period from January 2011 to December 2023 (*note that this is not the full sample*) by:
 - i) Obtaining the autocorrelation function (ACF) and the partial autocorrelation function (PACF) for the Δhpi_t series (specify the number of lags as 6).
[10%]
 - ii) Estimating all ARMA models from order (0, 0) to (6, 6) for the Δhpi_t series. (You would also need to report all relevant information for the models that you estimate, including the value of the AIC and SBIC and other relevant required criteria in a table).
[20%]
- e) Re-estimate only the appropriate model(s) identified in question (d). Again, use only the January 2011– December 2023 sample. Report and comment on the results. Carry out diagnostic checks on the residuals from these estimated model(s). Do the model(s) fit the data well?
[10%]
- f) Use the model(s) estimated in question (e) to generate one step ahead (static) forecasts for the period of January 2024 – July 2024. Plot a graph of the actual Δhpi_t series and the forecasts that you have generated over the specified out-of-sample period. Comment on the results.
[15%]

Conduct all your statistical tests at the 5% level.