Times Series Analysis Assignment (40% of Module)

Practical Information

- This assignment must be your own work. Evidence of copying will result in a score of zero.
- Deadline for choosing data: **Friday, April 7th (Week 11)**.
  - You are required to find a time series dataset that you will analyse for this assignment. See next page for some useful links.
  - The series must have at least 60 observations.
  - The series must not be white noise (i.e., `acf(series)` produces no significant autocorrelations) or a random walk (i.e., `diff(series)` series is white noise).
  - Once you have satisfied the above two points, email **kevin.burke@ul.ie** to confirm that no other student has selected this series already.
- Deadline for submitting report: **Friday, April 28th (Week 13)**.
  - Hard copy of report to be submitted to the Maths Department office: room D2034.
  - Electronic copy of report (.doc or .pdf file) and accompanying `R` script file (.R file) containing all code to be submitted using the "Assignments" section on Sulis.
  - The `R` script file must be organised so that the code can exactly replicate all results in the order in which they appear in your report.
  - The report may be prepared in Microsoft Word or in LaTeX - use 11pt text. For any `R` output, use the `courier` style font.

Report

Your report will include relevant `R` output and plots. This must be supplemented by your commentary on such output and clear rationale at each step in the model building process. Please include an introduction briefly describing the series under study (i.e., the subject matter / content, relevant historical / background information) and a conclusions section summarising the main findings in your analysis. As a rough guideline, 10 – 20 A4 pages is likely to be sufficient.

Main Steps

1) Load your data into `R` and store it as a `ts` object (see Tutorial 1).
2) Remove the last 10% of observations from your series. All analysis will be applied to the remainder of the series.

3) Assess whether or not the series is stationary and apply appropriate transformations if necessary.

4) Decide on some reasonable models for the data using the methods covered on this course.

5) Fit models to data.

6) Investigate residuals, compare models and decide on a final model.

7) Predict into the future using your model and compare these forecasts to the 10% of observations removed at the start.

Useful Links

The following links may be useful for finding an appropriate time series:

- `datamarket.com/data/list/?q=provider:tsdl`
- `cso.ie/en/databases/`
- `stats.oecd.org/`
- `ec.europa.eu/eurostat/data/database`
- `wid.world/#Database`
- `uk.finance.yahoo.com`
- `economicsnetwork.ac.uk/data_sets`
- `data.worldbank.org/topic`
- `imf.org/external/data.htm#data`
- `ec.europa.eu/economy_finance/db_indicators/surveys/time_series/index_en.htm`
