Macroeconometrics – The Projects

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Overview

- Groups of 1 to 3 students
- Different subjects will be proposed in March.
- Subjects and groups will be chosen by 13 April 2016.

  After that date, groups and subjects remain unchanged until the end of the semester.
- The project grade is based on:
  - (i) a report

    Maximum of 5 pages. About 5 pages of Appendices (figures and tables).
    The report has to address a specific research question.
    These main sections are required: Introduction, Data, Methodology, Results/Discussion.
    Clearly cite all references and provide a bibliography in standard academic format.
    Tables and figures are to be self-explanatory and clearly labeled.
    There needs to be an abstract of 100 words.
  - (ii) a presentation

    The last two sessions of the course will be dedicated to the presentation of the projects.
    A presentation will be about 20-minute long (depending on the number of groups).

Evaluation Matrix

Criteria	Evaluation				
	1 = Poor	2 = Below Average	3 = Average	4 = Above Average	5 = Excellent
Presentation of the report. The report is clearly structured according to guidelines. Care is taken in the aesthetics of the report.					
Quality of the written report. Respects the required structure. Each section develops the required notions in an appropriate manner.					
Understanding of the methodology. The report conveys a clear understanding of the methodology used in the report. The technical aspects are clearly demonstrated.					
Interpretation. The interpretations of the results of the research question are succinctly communicated. Particular attention to order of importance of the results is demonstrated.					
Appendix content. The appendix contains a pertinent selection of supporting material that is sufficiently self-contained and referred to in the main body of the report.					
Bibliography. The report uses external sources to support the research question. The external sources are accurately cited.					

Based on the evaluation matrix, a final grade will be determined using an appropriate grading scale. The purpose of the evaluation matrix is to enable students to be aware of the criteria that they will be assessed on. In addition, the group's presentation will be evaluated in a similar way and will add to the final grade.

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Evaluation Matrix

Criteria	Evaluation				
	1 = Poor	2 = Below Average	3 = Average	4 = Above Average	5 = Excellent
Presentation Slides. The slides are carefully structured and well designed. The number of slides is appropriate for the time allocation.					
Quality of slide content. The slides content relevant and concise information. Each section develops the required notions in an appropriate manner.					
Quality of explanations. The presenter(s) is/are able to convince the audience of their understanding of the topic being discussed.					
Ability to answer questions. The presenter(s) display(s) an adequate ability to answer questions asked.					
Presentation style. The presenter(s) is/are able to captivate the audience using an appropriate presentation style.					
Time management. The presenter(s) exhibits the ability to time manage during a dynamic slide presentation.					

Based on the evaluation matrix, a final grade will be determined using an appropriate grading scale. The purpose of the evaluation matrix is to enable students to be aware of the criteria that they will be assessed on. In addition, the group's report will be evaluated in a similar way and will add to the final grade.

Proposed Projects

Project 1 (Weather influence)

- **Objective**: To study the influence of weather on demographics (e.g. mortality), food prices or any other variables.
- **Econometric Tool**: ARMA-X.
- **Data (examples)**:
    - Monthly temperature data for France can be found *here*.
    - Number of deaths in France can be found *here*.
    - Food prices can be found *here* (Retail Prices and Consumer Price Indices/Average Retail Prices).
    - Naturally, data for any other area can be used.
- **Remarks**:
    - For that project, seasonality is an important issue.
    - Though the students may make use of external codes for de-seasonalisation tools (e.g. *stl* or *season package*), they are expected to discuss (in both the report and the presentation) the seasonality subject and its stakes.
    - They may also deal themselves with seasonality, using for instance *seasonal ARMA*.

Project 2 (Disaster impacts)

- **Objective**: To measure the influence of disasters on economic, demographic or health variables.
- **Econometric Tool**: ARMA-X.
- **Data**:
  - For that project, seasonality may be an issue as well (see Project 1).
  - Here is a relevant disaster database.

Project 3 (Monetary Policy Shocks)

- **Objective**: To study the impact of monetary policy shocks.
- **Econometric Tool**: Structural VAR model.
- **Data**:
    - Appropriate VAR models involve at least inflation, output and interest-rate data.
    - Different areas could be compared.
    - The robustness of the results will be discussed carefully.
- **A relevant reference**: Christiano, Eichenbaum and Evans (1998).

Project 4 (Demand and Supply Schoks)

- **Objective**: To compute output gaps for different economies using Blanchard and Quah (1989)'s methodology.
- **Econometric Tool**: Structural VAR model.
- **Data**:
    - Unemployment and Inflation series for different countries.

Project 5 (Macroeconomic Forecasting)

- **Objective**: To forecast macroeconomic variables.
- **Econometric Tool**: ARMA(-X) or VAR processes.
- **Data**:
    - Monthly or quarterly data.
    - At least three different variables will be forecasted (different types of variable or different areas).
    - Great care will be given to the computation of confidence intervals.
    - Different econometric tools may be used and compared.
    - Out-of-sample forecasts will be presented.
    - The realised forecasts may be compared to those obtained by professional forecasters (e.g. *U.S. SPF* or *Euro Area SPF*).

Project 6 (New internet-based data)

- **Objective**: To exploit internet-based data (forecasting, nowcasting).
- **Econometric Tool**: Any time series related tool.
- **Data**:
    - E.g. Google trend data.
    - Seasonality may be an issue (see Project 1).

Project 7 (Financial contagion: Sovereign spreads)

- **Objective**: To investigate potential interactions across sovereign spreads of different countries.
- **Econometric Tool**: VAR.
- **Data**:
    - For instance: Eurostat (Economy and Finance/Interest Rates/Long Term Interest Rates/EMU Convergence Criterion Series).
    - Different periods should be considered (to study potential change in the interactions: for instance before/after the crisis).

Project 8 (Dynamics of long-term interest rates)

- **Objective**: To build a model of the joint dynamics of long-term interest rates and inflation.

- **Econometric Tool**: Error Correction Model.

- **Data**:
    - Monthly data of inflation and long-term interest rates.
    - Different areas will be considered.

- **Remark**:
    - The model may be used to forecast both series and compared to univariate models.

Project 9 (Factor-Augmented VAR)

- **Objective**: To understand and use a FAVAR, that is an extension of VAR models.

- **Econometric Tool**: FAVAR

- **Data**:
    - Monthly or quarterly data for many macroeconomic variables (about 100).

- **Remarks**:
    - FAVAR is an extension of VAR that makes it possible to jointly model a large number of variables.
    - The students will first have to get familiar with Principal Component Analysis (see for instance this or Subsection 1.1 in Jolliffe 2002).
    - Bernanke and Boivin (2003) is a famous example of application in economics.
    - Since this tool will not be studied in the course, a lower weight is given to the application and a higher one to the exposition of the algorithm (in both the report and the oral presentation).

Project 10 (Kalman filter)

- **Econometric Tool**: Kalman filter, which is an econometric tool aimed at estimating unobserved (or latent) variables.

- **Objective**: To understand and to illustrate the algorithm.

- **Possible Applications**:
    - Trend-Cycle decomposition.
    - Deseasonalisation of time series (example: Section 2 in Koopman and Lee (2008)).
    - (exact) MLE estimation of an MA(q) processes.

- **Remark**:
    - Since this tool will not be studied in the course, a lower weight is given to the application and a higher one to the exposition of the algorithm (in both the report and the oral presentation).