Macroeconometrics (Lent Term 2006) Syllabus

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1 Outline

1. Business cycles [1 week]
   ⇒ *Burda and Wyplosz (2001, chapter 14), Abel and Bernanke (2003, chapter 8)*

   (a) Time series evidence

   (b) Macroeconomic theories and concepts

   (c) Empirical modelling approaches

2. Difference equations [2 weeks]
   ⇒ *Enders (2003, chapter 1), Hamilton (1994, chapters 1, 2), Chiang (1984, chapters 16, 17)*

   (a) Definition and economic examples

   (b) Solving difference equations by iteration

   (c) A general method for solving difference equations

3. Stationary time series models [2 weeks]
   ⇒ *Enders (2003, chapter 2), Hamilton (1994, chapters 3, 4)*

   (a) ARMA models

   (b) Stationarity and invertibility

   (c) Autocorrelation and partial autocorrelation functions

   (d) Box-Jenkins model selection procedure

   (e) Forecasting

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4. Trends and seasonality in time series [2 weeks]
   ⇒ *Enders (2003, chapter 4), Hamilton (1994, chapters 15–17)*

   (a) Deterministic and stochastic trends

   (b) Testing for unit roots

   (c) Seasonality

5. Multivariate time series models [2 weeks]
   ⇒ *Enders (2003, chapter 5), Hamilton (1994, chapters 10, 11)*

   (a) Vector autoregression analysis

   (b) Estimation and identification

   (c) Impulse response functions and variance decompositions

   (d) Hypothesis testing

   (e) Structural vector autoregressions

   (f) Examples of structural decompositions

6. Cointegration and error-correction models [2 weeks]
   ⇒ *Enders (2003, chapter 6), Hamilton (1994, chapter 19)*

   (a) Cointegration of macroeconomic time series

   (b) Cointegration and common trends

   (c) Cointegration and error correction

   (d) Testing for cointegration

7. Time series in the frequency domain [1 week]

8. Nonlinear time series models [1 week]
   ⇒ *Enders (2003, chapter 7), Hamilton (1994, chapter 22)*

   (a) Switching regimes

   (b) Threshold autoregressions

2 Literature

The main textbook for this course is Enders (2003). The book provides a very accessible introduction to time series analysis. It contains many examples and economic applications. The emphasis is on econometric intuition and matrix algebra and mathematical proofs are kept to a minimum. The author has also written a handbook with instructions on how time series can be estimated with the RATS software package (Enders, 1996); however, since we use EViews in this course, the handbook will be of limited use for us.

A useful reference for the topics covered in this course is Hamilton (1994); students might in particular wish to consult the mathematical appendix of the book, which explains in simple terms

the mathematical concepts used in time series analysis. The book is written in a very clear and concise style. However, students should be aware that the individual chapters of the book tend to go into more detail than is required for this course.

3 Software

There will be computer sessions after the topics 3, 4, 5, 6, in which we will analyze time series data using the EViews software package. Instructions on how to use EViews will be given during the lectures and computer sessions.

4 Problem sets and written assignments

There will be seven problem sets, one for each topic. In addition, students will have to hand in two written assignments, in which they apply time series methods to economic data using EViews.

References

Abel, A. B. and Bernanke, B. S. (2003), *Macroeconomics*, Addison Wesley, Boston, London.

Burda, M. and Wyplosz, C. (2001), *Macroeconomics: a European text*, Oxford University Press, Oxford.

Chiang, A. C. (1984), *Fundamental Methods of Mathematical Economics*, McGraw-Hill, New York.

Enders, W. (1996), *RATS Handbook for Econometric Time Series*, John Wiley and Sons, New York, Chichester, Brisbane.

Enders, W. (2003), *Applied Econometric Time Series*, John Wiley and Sons, New York, Chichester, Brisbane.

Hamilton, J. D. (1994), *Time Series Analysis*, Princeton University Press, Princeton, New Jersey.