Empirical Methods in Macroeconomics (module I)

Jonas Dovern
The Kiel Institute for the World Economy

September 2007

This course presents basic methods that are used in macroeconometrics and applies them to simple empirical examples (e.g. wage formation, labour demand, money demand). The course intends to teach participants with little pre-knowledge in econometrics how to work on empirical issues in economics. Participants have PC-access to do own estimations. The course includes a first introduction to EViews. The basic readings for the course are the manuscripts that will be handed out. An outline of the covered topics is presented below:

1. Introduction to Econometrics

2. The Classical Multiple Regression Model

3. Properties of the *OLS* Estimator

4. Hypothesis Tests

5. Selection of Explanatory Variables

6. Forecasting

7. Tests of the Assumptions of the *OLS*

Empirical Methods in Macroeconomics (II module)

Carlo Rosa
The Kiel Institute for the World Economy
September 2007

Outline

1 - Overview and Review

Outline of the Course. Review: a) Assumptions for the Least Squares Estimator, b) Properties of the Least Squares Estimator, c) From Economic Theory to the Econometric Model, d) Testing in Econometrics. An Example.

* Lecture Notes (Chapter 1)
W.H. Greene, *Econometric Analysis*. Upper Saddle River, N.J.: Prentice-Hall, Inc., 1997. (Chapter 1, 6)
C.A. Favero, *Applied Macroeconometrics*, Oxford University Press, Oxford, 2001. (Chapter 1)

2 - Dynamic Models in a Stationary World

Partial Adjustment. Stationarity. Consistency of an Estimator. The Presence of Autocorrelation. Testing for Autocorrelation. Instrumental Variable Estimation. The Labor Demand Example (I part).

* Lecture Notes (Chapter 2)
W.H. Greene, *Econometric Analysis*. Upper Saddle River, N.J.: Prentice-Hall, Inc., 1997. (Chapter 17)
C.A. Favero, *Applied Macroeconometrics*, Oxford University Press, Oxford, 2001. (Chapters 2, 5)

3 - Generalized Dynamic Models

The Rational Distributed Lag Model. Specification Criteria. The Error Correction Model. The Labor Demand Example (II part).

* Lecture Notes (Chapter 3)
W.H. Greene, *Econometric Analysis*. Upper Saddle River, N.J.: Prentice-Hall, Inc., 1997. (Chapter 18)
R.F. Engle, and C.W.J. Granger, Cointegration and Error Correction. Representation, Estimation, Testing. *Econometrica* 55(2): 251–276, 1987.

4 - Non-Stationarity

Non-Stationary Stochastic Processes and Order of Integration. The Moments of Integrated Variables. Testing for the Order of Integration. An Example.

* Lecture Notes (Chapter 4)
J. Hamilton, *Time series analysis*. Princeton University Press, Princeton, 1994. (Chapters 15, 16, 17, 18)

5 - Estimating Single Equations with Non-Stationary Variables

Cointegration. Cointegration and the Error Correction Model. Properties of the Estimators. The Engle-Granger Two-Step Procedure. Estimating the Error Correction Model and Testing for Cointegration. Weak Exogeneity. Granger Causality. An Example.

* Lecture Notes (Chapter 5)
J. Hamilton, *Time series analysis*. Princeton University Press, Princeton, 1994. (Chapter 19)
S. Johansen, *Likelihood-Based Inference in Cointegrated Vector Autoregressive Models*. Oxford: Oxford Univ. Press, 1995.

6 - Vector Autoregression (VAR) Models

VAR models and identification. The identification problem: a) Choleski decomposition, b) Structural VAR models with contemporaneous restrictions, c) Structural VAR models with long-run restrictions. Estimation of structural VAR models. Interpretation of structural VAR models. Impulse response functions (IRF). Forecast error variance decomposition (FEVD). Example.

* Lecture Notes (Chapter 6)
* C.A. Favero, *Applied Macroeconometrics*, Oxford University Press, Oxford, 2001. (Chapter 6)
G. Amisano, and C. Giannini (1997), *Topics in Structural VAR Econometrics*, Springer, Berlin.
L.J. Christiano, M. Eichenbaum and C.L. Evans (1999). Monetary Policy Shocks: What Have We Learned and to What End?, in: J.B. Taylor and M. Woodford (eds.), Handbook of Macroeconomics, Vol. 1A, p. 65-148.
J. Gali, Trends in Hours, Balanced Growth, and the Role of Technology in the Business Cycle, UPF Working Paper, 2005.
J. Hamilton, *Time series analysis*. Princeton University Press, Princeton, 1994. (Chapters 10, 11)
H. Lütkepohl, *New Introduction to Multiple Time Series Analysis*. Berlin: Springer-Verlag, 2005.
C.A. Sims, Macroeconomics and Reality, *Econometrica*, 48, 1-48, 1980.
J.H. Stock, and M.W. Watson, Vector Autoregressions, *Journal of Economic Perspectives* 5, 101-115, 2001.

*** Starred readings are required**