Outline Applied Econometric Time Series course (MSc 5314, Winter, 2024)

Textbook: Applied Econometric Time Series, Walter Enders, 4th edition, Wiley

- Introduction (Lecture 1)
- Chapter 2: Stationary time series models (Lectures 1-3)

  2.2 ARMA models, 2.3 Stationarity, 2.4 Stationarity restrictions for an ARMA(p,q) model, 2.5 The autocorrelation function, 2.6 The partial autocorrelation function, 2.7 Sample autocorrelations of stationary series, 2.8 Box-Jenkins model selection, 2.9 Properties of forecasts, 2.10 A model of the interest rate spread, 2.12 Parameter instability and structural change

- Chapter 4: Models with trends (Lectures 4-5)

  4.1 Deterministic and stochastic trends, 4.2 Removing the trend, 4.3 Unit roots and regression residuals, 4.5 Dickey-Fuller tests, 4.6 Examples of the Dickey-Fuller test, 4.7 Extensions of the Dickey-Fuller test, 4.8 Structural change, 4.9 Power and the deterministic regressors, 4.10 Tests with more power.

- Chapter 5: Multiequation time-series models (Lectures 6-7)

  5.4 Limits to structural multivariate estimation, 5.5 Introduction to VAR analysis, 5.6 Estimation and identification, 5.7 The impulse response function, 5.8 Testing hypotheses, 5.10 Structural VARs, 5.11 Examples of Structural decompositions, 5.13 The Blanchard-Quah decomposition, 5.14 Decomposing real and nominal exchange rates: an example.

- Chapter 6: Cointegration and error correction models (Lectures 8-10)

  6.1 Linear combinations of integrated variables, 6.2 Cointegration and common trends, 6.3 Cointegration and error correction. 6.4 Testing for cointegration: the Engle-Granger methodology, 6.5 Illustrating the Engle-Granger methdology, 6.6 Cointegration and purchasing power parity, 6.7 Characteristic roots, rank, and cointegration, 6.8 Hypothesis testing, 6.9 Illustrating the Johansen methodology, 6.10 Error-correction and the ADL test, 6.11 Comparing the three methods

- Chapter 7: Nonlinear time-series models (Lectures 11-12)

  7.1 Linear versus nonlinear adjustment, 7.3 Pretesting for nonlinearity, 7.4 Threshold autoregressive models, 7.5 Extensions of the TAR model, 7.6 Three threshold models, 7.7 Smooth-transition models, 7.9 Estimation of STAR models.

Remarks: Chapters 1 and 3 are optional. Chapter 7 is covered if time allows. At the end of the course (and after the exam) there might be the option (100% voluntarily) to take two extra lectures: one on nonlinear time series modelling and another one on ML methods/algorithms for prediction and forecasting.