

Inhoudstafel Econometrie: Tijdreeksanalyse

Part 1: Univariate Time Series Analysis

Chapter 1: ARIMA models

- Introduction
 - Characteristics of a Time Series
 - Univariate Time Series Models
 - Motivation
- Building ARIMA models
 - Defining stationary and non-stationary
 - Autocorrelation and Partial Autocorrelation Function
 - Defining a White Noise Process
 - Moving Average Process
 - Defining a Moving Average Process
 - Dynamic Behaviour of a Moving Average Process
 - Properties of a Moving Average Process
 - Example MA process
 - Warning
 - Autoregressive Process
 - Defining an Autoregressive Process
 - AR(1)
 - Dynamic Behaviour of an AR(1) Process
 - Properties of an AR(1) Process
 - Examples AR(1) Process
 - Interlude: invertibility of Lag Polynomials
 - AR(p)
 - Dynamic Behaviour of an AR(p) Process
 - Properties of an AR(p) Process
 - Examples AR(p) Process

- An ARMA Process
 - Defining an ARMA Process
 - Dynamic Behaviour of an ARMA(p, q) Process
 - Properties of an ARMA(p, q) Process
 - Common or cancelling roots
 - Examples ARMA(p, q) process
- Fitting ARMA models to the data
 - The Box-Jenkins Approach
 - Estimating ARMA models
 - Information criteria
 - Diagnostic Checking
- Forecasting using ARMA models
 - Terminology
 - Building Forecasts
 - Forecasting with MA models
 - Forecasting with AR models
 - Forecasting with ARMA models
 - Forecasting Accuracy
 - Parameter uncertainty
 - Model selection from forecasting accuracy

Chapter 2: Testing for Unit Roots

- Stationarity versus Non-stationarity
 - Deterministic non-stationarity
 - Stochastic non-stationarity
 - Random walk
 - Random walk with drift
- Transformations to stationary series
 - Deterministic non-stationarity
 - Stochastic non-stationarity

- Dickey-Fuller Test
 - How do we test for a unit root?
 - The basic Dickey-Fuller (DF) test
 - Extending the DF test: adding an intercept
 - Extending the DF test: adding an intercept and a trend
 - The Augmented Dickey-Fuller test
 - Back to the normal distribution
 - Caution!!!
- Model selection (Selecting the appropriate model)
 - Selecting the appropriate order of the AR process
 - Selecting the appropriate deterministic terms
- Pitfalls in unit root testing
 - Power
 - Structural breaks
 - Multiple unit roots

Part 2: Multivariate Time Series Analysis

Chapter 3: ADL Models

- Introduction
 - Dynamic Models with Stationary Variables
 - Some motivation for including dynamics
- Defining ADL
 - Generalisations
- Estimating ADL models
- Limitations
- Example: Consumption, income and wealth

Chapter 4: VAR Models

- Introducing VAR models
 - Structural VAR
 - Reduced-form VAR
 - Extensions

- Estimating VAR models
 - Model selection
 - Diagnostics
 - Implementation in EViews
- Analysing VAR models
 - Forecasting
 - Granger causality analysis
 - Impulse response function
 - Variance decomposition
- Identifying the structural VAR
 - Identification problem
 - Solving the identification problem
 - Recursive identification scheme
 - Non-recursive identification scheme
 - Restrictions on long-run responses
 - Sign restrictions

Chapter 5: Cointegration analysis

- Basic concepts
 - Spurious regression
 - The spurious regression problem
 - Examples of spurious regression
 - Simulating the spurious regression problem
 - Implication
- Cointegration
 - Definition cointegration
 - Example
 - Economic interpretation
 - Econometric implication
 - Simulating cointegrating regressions
- Error correction
 - Cointegration and Error-Correction Mechanisms
 - Example of an error-correction model
 - Important remark
 - A more general error-correction model

- Properties of OLS
 - Super consistency
 - Ignoring dynamics
 - Ignoring endogeneity
- Testing for cointegration
 - The Engle-Granger two –step approach
 - Step 1: estimate static model and test for cointegration
 - 1. Cointegration Regression Durbin-Watson (CRDW) test
 - 2. ADF cointegration test
 - Step 2: Estimate an ECM to analyse the short-run dynamics
 - Example: consumption, income and wealth in the US
 - Pitfalls in the Engle-Granger two-step approach
 - Alternative approaches
 - Alternative 1: Testing for cointegration in the ECM
 - Alternative 2: Multivariate approach (Johanson)
- ADL and VAR models with non-stationary data
 - Unrestricted ADL versus restricted ECM model
 - Implications of including non-stationary data in unrestricted ADL or VAR model

Part 3: Extra Topics

Chapter 6: Panel Data

- Introduction
 - Structure panel data
 - Advantages
 - Disadvantages
 - Illustration: Explaining individual wages (Verbeek, 2012)
- Standard linear panel data model
 - Static linear model: general specifications
 - Static linear model: estimation
 - The simplest case: the pooled OLS estimator
 - Illustration: Explaining individual wages (Verbeek, 2012)
 - Results pooled OLS

- The fixed effects estimator
 - Standard extension 1: the fixed effects estimator
 - Standard extension 2: the random effects estimator
 - The fixed effects estimator
 - Disadvantages
 - Illustration: Explaining individual wages (Verbeek, 2012)
 - Results fixed effects estimator
 - Properties of the fixed effects estimator
- The random effects estimator
 - Structure of the error term in the random effects model
 - Interlude: the GLS estimator
 - Random effects GLS estimator
 - Random effects EGLS estimator
 - Interlude: the between estimator
 - Illustration: Explaining individual wages (Verbeek, 2012)
 - Results of the random effects estimator
- Summarising the properties
 - The between estimator
 - The within estimator
 - The pooled estimator
 - The random effects estimator
- Hausman Test
 - Fixed or random effects
 - Hausman test
 - Illustration: Explaining individual wages (Verbeek, 2012)
- Panel data with non-stationary data
 - Motivation
 - Panel Unit Root tests
 - First generation panel unit root tests
 - Levin, Li and Chu (LLC) pooled panel unit root test
 - Im, Pesaran and Shin (IPS) averaged panel unit root test
 - Maddala and Wu (1999) combined panel unit root test
 - Illustration: The Fisher hypothesis
 - Panel unit root tests in EViews

- Second generation panel unit root tests
 - Bai and Ng's (2004) Panel unit root test
- Panel cointegration analysis
 - MW cointegration test
 - Illustration: The Fisher hypothesis
 - No spurious regression