UTDT
Maestria en Economia /Econometria
Series de Tiempo

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Pagina: https://sites.google.com/site/tiempodeseries/.

Aims

This course aims to familiarise students with modern econometric techniques relating to the analysis of financial time series. The interaction between economic theory and econometric analysis is emphasised, and students will be trained in formulating, estimating and testing models for time series.

Learning Outcomes

At the end of the course, students will be able to demonstrate that they can:

- Develop and analyse simple models for stationary univariate time series.
- Understand the principles and applications of VAR modelling and use them in practice.
- Understand the implications of nonstationarity for econometric modelling and know how to choose appropriate models for nonstationary and cointegrated time series.
- Develop and analyse simple models of dynamic heteroscedasticity.
- Understand the implications of structural breaks and unobserved components in econometric modelling.
- Use standard econometrics packages and interpret their output.
- Understand and critically assess empirical findings reported in the applied economics and finance literature.

Teaching Arrangements

The course is taught over 10 weeks. There are a lectures (Tuesdays) and classes to go through problem sets.

Course Assessment

There will be a take home exercises that will involve the use of standard econometric packages.

Reading

Typed lecture notes are provided but students should also refer to the following texts for more detailed discussions on the various topics:

Recommended Textbooks

Hamilton, J.D (1994), *Time series Analysis*, Princeton University Press.
Hayashi, F. (2000), *Econometrics*, Princeton University Press.
Kim C. J. and Nelson (1999) State Space Models with Regime Switching MIT Press.
V. Martin, S. Hurn and D. Harris. (2013) Econometric Modelling with Time Series.

Easier Treatment of the Material

ENDERS, W. (1995), *Applied Econometric Time Series*, New York: Wiley.

FRANSES, P. H. (1998), *Time Series Models for Business and Economic Forecasting*, Cambridge: Cambridge University Press.

HARVEY, A. C. (1993), *Time Series Models*, 2nd Ed., New York: Harvester Wheatsheaf.

MILLS, T. C. (1999), *The Econometric Modelling of Financial Time Series*, 2nd Ed., Cambridge: Cambridge University Press.

PATTERSON, K. (2000), *An Introduction to Applied Econometrics: A Time Series Approach*, London: Macmillan.

Lecture Schedule

1) REVIEW OF STATIONARY TIME-SERIES MODELS
Properties of ARMA processes; estimation of ARMA models; model selection; forecasting.

Lecture notes
Hamilton (1994), Chs. 1-5.
Hayashi, F. (2000), Ch 6.
Also:
Enders (1995), Chs. 1–2.
Franses (1998), Ch. 3.
Harvey (1993), Chs. 2–3.
Mills (1999), Ch. 2

2) VECTOR AUTOREGRESSIVE MODELS
VAR model building; impulse-response analysis; Granger causality.

Lecture notes
Hamilton (1994) Chs. 10-11.
Also:
Enders (1995), Ch. 5.
Franses (1998), Ch. 9.
Harvey (1993), Ch. 7.
Mills (1999), Ch. 6.

3) NOSTATIONARY TIME-SERIES MODELS
Unit-root processes; testing for unit roots; spurious regressions.

Lecture notes
Hamilton (1994), Chs. 15-17.
Hayashi, F. (2000), Ch 9.

Also:

Enders (1995), Ch. 4.
Franses (1998), Ch. 4.
Harvey (1993), Ch. 5.
Mills (1999), Chs. 3–4.
Patterson (2000), Chs. 6–7.

4) COINTEGRATION AND ERROR-CORRECTION MODELS

Autoregressive distributed lag models; representation of cointegrated systems; testing for cointegration; estimation of cointegrated systems.

Lecture notes
Hamilton (1994), Chs. 19-20.
Hayashi, F. (2000), Ch 10.
Also:

Enders (1995), Ch. 6.
Franses (1998), Ch. 9.
Harvey (1993), Ch. 7.
Mills (1999), Ch. 7.
Patterson (2000), Chs. 8, 14.

5) TIME-SERIES MODELS OF HETEROSCEDASTICITY
ARCH, GARCH, and EGARCH models; maximum-likelihood estimation; model selection.

Lecture notes
Hamilton (1994), Ch. 21.

Also:
Enders (1995), Ch. 3.
Franses (1998), Ch. 7.
Harvey (1993), Ch. 8.
Mills (1999), Ch. 4.
Patterson (2000), Ch. 16.

6) MULTIVARIATE NON-LINEAR STOCHASTIC MODELS
Lecture notes
Hamilton (1994), Ch. 21.

Also:
Enders (1995), Ch. 3.
Franses (1998), Ch. 7.
Harvey (1993), Ch. 8.
Mills (1999), Ch. 4.
Patterson (2000), Ch. 16.
7) THRESHOLD MODELS
Lecture notes

8) MARKOV SWITCHING MODELS: APPLICATIONS TO FINANCE.
Lecture notes
Hamilton (1994), Ch. 22.

9) THE KALMAN FILTER
Lecture notes
Hamilton (1994), Ch. 13.

10) Generalized Method of Moments
Lecture notes
Hamilton (1994), Ch. 14.

11) Markov Chain Montecarlo
Lecture notes
Kim and Nelson (1999), Chs. 7, 9.