



APPLIES TO ACADEMIC YEAR 2016/2017

DRE 7002 Time Series Econometrics

Programme

Economics

Responsible for the course

Hilde C Bjørnland

Department

Department of Economics

Term

According to study plan

ECTS Credits

6

Language of instruction

English

Introduction

The aim of the course is to give the students a formal understanding of time series econometrics at a level expected among Ph.D students in economics, finance and related disciplines.

Learning outcome

After taking this course students should have a solid knowledge of the basic techniques used in time series econometrics, so that eventually they can master and produce sophisticated applied econometric analysis. The students will learn univariate and multivariate models of stationary and nonstationary time series, including structural VARs, state space models, the Kalman filter and factor models. The students will learn to master the main estimation methods, such as maximal likelihood, instrumental variables and GMM. If time permits, we will also cover estimation of DSGE models (topic VI).

Prerequisites

Admission to a PhD Programme is a general requirement for participation in PhD courses at BI Norwegian Business School.

External candidates are kindly asked to attach confirmation of admission to a PhD programme when signing up for a course with the doctoral administration. Candidates can be allowed to sit in on courses by approval of the course leader. Sitting in on courses does not permit registration for courses, handing in exams or gaining credits for the course. Course certificates or confirmation letters will not be issued for sitting in on courses

Compulsory reading

Books:

Bjørnland, Hilde C., Leif Anders Thorsrud. 2015. Applied time series for macroeconomics. 2. utg.. Gyldendal akademisk

Hamilton, James D. 1994. Time series analysis. Princeton University Press

Articles:

During the course there may be hand-outs and other material on additional topics relevant for the course and the examination

Recommended reading

Books:

Favero, Carlo A.. 2001. Applied macroeconometrics. Oxford University Press. Chapter 1,2,3, 6, 7 and 8

Lütkepohl, Helmut. 1993. Introduction to multiple time series analysis. 2nd ed. Springer. Utgitt i 2005 med tittelen: New introduction to multiple time series analysis

Course outline

I. Univariate stationary time series

- Stationary AR and MA processes
- Forecasting
- Spectral analysis

II. Models of non-stationary time series

- Deterministic and stochastic trends, unit root tests, structural change
- Trend/cycle decompositions (linear filters)
- Analysis of business cycles in the frequency domain, spurious cycles

III. Vector autoregression (VAR) methodology

- Granger causality, cointegration.
- Structural VARs – impulse responses, forecast error variance decomposition
- Identification: Cholesky, long-run restrictions and sign restrictions

IV. Methods of Estimation

- Instrumental variables (IV) estimation
- Maximum likelihood estimation
- Generalized method of moments (GMM) estimation

V. State space models and the Kalman filter

- Kalman filter
- Factor models

VI. Estimating DSGE models

- Bayesian estimation
- Local approximation of linearized models

Computer-based tools

The course uses modern statistical software such as EViews, RATS or MATLAB. Knowledge of EXCEL is required.

Learning process and workload

Workload (6 ECTS)

Lectures	30 hours
Specified learning activities (including reading)	75 hours
Autonomous student learning (including exam preparation)	75 hours
Total	180 hours

Course structure and grading:

The course will be taught in three intensive modules. Each module consists of 2*5 hours (2 days and 5 hours per day).

Students are required to participate in class – both in discussions and by presenting models/material from the reading lists – as well as solve and hand in solutions to exercises and problems.

Examination

The final grade is pass/fail. 30 hours home exam.

Examination code(s)

DRE 70021 home exam accounts for 100% of the grade

Examination support materials

Not applicable

Re-sit examination

Re-takes are only possible at the next time a course will be held. When the course evaluation has a separate exam code for each part of the evaluation it is possible to retake parts of the evaluation. Otherwise, the whole course must be re-evaluated when a student wants to retake an exam.

Additional information

Honour Code

Academic honesty and trust are important to all of us as individuals, and represent values that are encouraged and promoted by the honour code system. This is a most significant university tradition. Students are responsible for familiarizing themselves with the ideals of the honour code system, to which the faculty are also deeply committed.

Any violation of the honour code will be dealt with in accordance with BI's procedures for cheating. These issues are a serious matter to everyone associated with the programs at BI and are at the heart of the honour code and academic integrity. If you have any questions about your responsibilities under the honour code, please ask.