

Department of Economics, Norwegian University of Science and Technology

Ph.D. course:

Multivariate Likelihood-based Analysis of Financial Time Series



Dates

12-16 December, 2011

Lecturers

Associate Professor [Heino Bohn Nielsen](#) and Professor [Anders Rahbek](#), University of Copenhagen.

Aims and content

The course will cover selected methods within multivariate analysis of macroeconomic and financial time series. The course will cover theory, programming and applications. For each topic, econometric methods are discussed and illustrated by empirical applications.

Upon completion of the course the student will have obtained a fundamental knowledge of selected likelihood-based econometric modeling. Focus will be on analyzing econometric models such that their properties are well-understood from a methodological point of view. This will include theory for estimation and testing, dynamic properties and linkage with applied literature. It will also include empirical implementation of the econometric models.

Credits and evaluation

The course credits are 7.5 ECTs.

Evaluation will be based on class participation as well as a hand-in assignment given by the end of the course.

Local organizer

Professor [Gunnar Bårdsen](#). Email: Gunnar.Bardsen@svt.ntnu.no

Participation

There is no course fee. Funds are available to support travel and accommodation for external participants.

Please send a short application to econ@svt.ntnu.no within 15 November.

The application should cover personal details and student status. If you want to apply for travel support, you should also stipulate approximate travel costs.

Outline

As mentioned the course covers selected methods within multivariate analysis of macroeconomic and financial time series. The course will cover theory, programming and applications. For each topic, econometric methods are discussed and illustrated by empirical applications.

In the first part of the course, we will discuss analysis of asset returns using multivariate GARCH models with application to portfolio selection. This will include discussion of multivariate covariance specifications, some asymptotic theory results, portfolio selection and implementation. In the second part, we will cover the analysis of static and dynamic asset pricing models. This includes discussion of capital asset pricing (CAPM) and arbitrage pricing theory (APT) based on factor models with observed and unobserved factors.

Computations and exercises

Part of the lectures will be discussing exercises which address theory and also discuss how to modify code handed-out for implementation.

How to Prepare for the Course

The students should be familiar with the basic theory of univariate ARCH models, that is basic properties and estimation based on Gaussian maximum likelihood. Ideally, this should also include ability to programme maximization of the classic ARCH(1) Gaussian likelihood function in “ox” or some other language.

Timetable

The lecture venue is [Dragvoll University Campus](#).

Monday: 13:15-15:00,

Tuesday: 9:15-11:00, 13:15-15:00

Wednesday: 9:15-11:00, 13:15-15:00

Thursday: 9:15-11:00, 13:15-15:00

Friday: 9:15-12:00

Reading list:

Lecture notes by Heino Bohn Nielsen and Anders Rahbek, University of Copenhagen.