Financial Econometrics

Continuous Time Econometrics with Applications in Asset Pricing

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Purpose

The aim of this course is to enhance the understanding of some of the time series econometric methods and models used in continuous time. The courses is an extension to the discrete time series methods and analysis covered in Econometrics II (623). Students who wish to take this course must have taken Econ623.

Content Outline

Topic 1: Ordinary differential equations: theory

Topic 2: Ordinary differential equations: numerical issues

Topic 3: Asymptotic theory for IID sequence, ergodic sequence and martingales

Topic 4: Brownian processes and stochastic differential equations

Topic 5: Levy processes

Topic 6: Continuous time models in asset pricing

Topic 7: Econometric analysis of continuous time models in asset pricing

- Exact maximum likelihood
- Quasi maximum likelihood
- GMM
- Bayesian methods
- Simulation based methods
- Asymptotic theory
- Finite sample theory

Topic 8: Multivariate continuous time models

Topic 9: Unit roots, local-to-unity, and moderate-deviation from unity, structural break in continuous time models
Topic 10: Fractional continuous time models

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Learning Resources: Books

Arnold, V.I., 1973, Ordinary different equations, MIT


Learning Resources: Research Papers


