Course description

This course examines model selection and other statistical techniques used to model time series data with a special emphasis to applications in finance and macroeconomics. The course has three specific objectives. The first is to equip students with the tools they need for state-of-the-art empirical research in this area. The second objective is to lay out the econometric theory of model selection, with an emphasis on recent developments. The third objective is to analyze selected recent works and their empirical implications.

The course is built so that for each topic the econometric tool is presented first, followed by the relevant empirical applications. Among the topics, the course will cover:

i) Review of tests for unit roots and applications to efficient tests of stock return predictability both at short and long horizons

ii) Tests for structural breaks and applications to models of exchange rate dynamics

iii) Forecasting and structural breaks, and applications to the Term Structure and other financial variables as predictors of future GDP growth and inflation dynamics
Preliminary reading list and references

- **1. Introduction: An overview of the time series properties of macro and finance data**
  - Description of time series data, model selection, structural breaks and forecasting: a paper that gives an overview of what will be covered in this course

- **2. Modeling and inference in persistent time series, with applications to stock return predictability and exchange rates**
  - Econometric theory: Univariate tests for unit roots
    - *chp. 9 H,*
  - Economic applications: Short and Long Horizon regressions in Finance and Macroeconomics
  - Goal: Learn to test for unit roots and construct confidence intervals for the largest root, implement efficient tests of predictability at both short and long horizons

- **3. Structural breaks and model selection in unstable environments**
  - Econometric theory: tests for structural breaks
- Rossi, B. (2005), Optimal tests for nested model selection in the presence of underlying parameter instability, Econometric Theory
- Giacomini and B. Rossi (2006), Non-nested model selection in unstable environments, mimeo

○ Economic applications: Empirical evidence on structural breaks and their implications for an forecasting inflation and exchange rates


○ Goal: Learn how to test for structural breaks, evaluate the power of the term structure as a predictor of real economic activity

- 4. Forecasting
  ○ Econometric theory: tests for equal and absolute predictive ability

○ Economic applications: forecasting inflation and GDP growth by using the term structure and asset prices

Goal: Learn how to make and evaluate forecasts and test for equal predictive ability