

## Class outline

Class Title: Financial Econometrics  
Instructor: CHEUNG Ying Lun and Sui LUO  
Venue and Class Time:

- Mon 08:00-10:00 博学楼 606
- Wed 10:00-12:00 博学楼 502

Office Hours: TBA

## Course Overview

The course introduces students to econometric methods applied in financial economics. In particular, this course focuses on the estimation and inferential methods used in empirical analysis of modern finance theory. Because of the econometric emphasis, we may review materials of probability theory, estimation and hypothesis testing during the classes. Due to the applied emphasis, classes will cover MATLAB and Stata programming to implement the tools discussed in the lectures as well. The course schedule outlined below includes topics to be covered in this courses.

## Course Schedule

- 1. The Characteristics of Financial Market Data**
  - a. Asset returns and compounding
  - b. Review of statistical distributions
  - c. Value-at-Risk and Expected Shortfall
- 2. Stationary Time Series**
  - a. Efficient Market Hypothesis
  - b. Stationarity and Ergodicity
  - c. ARMA processes
  - d. Estimation, Inference and Model Selection
  - e. Forecasting
- 3. Nonstationary Time Series (I)**
  - a. Deterministic Trends and Unit Root
  - b. Unit Root Tests
  - c. ARIMA processes
- 4. Nonstationary Time Series (II)**

- a. Explosive process and co-explosive process
- b. Testing for price bubbles (Real Estate Index, Stock Price)

## **5. Multivariate Time Series Modeling**

- a. Vector Autoregressions and Impulse Response Function
- b. Cointegration and Spurious Regression
- c. Vector Error Correction Model (VECM)

## **6. Volatility**

- a. Volatility Clustering of Asset Price Processes
- b. ARCH, GARCH Model and Alternative Specifications
- c. Stochastic Volatility Models
- d. Realized Volatility, Implied Volatility and VIX
- e. Volatility Forecasting

# **Computation**

It is necessary to develop computational skills to complete the assignments and projects. You can use either Eviews , Matlab, Stata or other software for assignments. Eviews is easy to apply, especially for time series. Here is a useful link to get familiar with Matlab: <http://www.spatial-econometrics.com/>.

# **Reference**

For each topic, we will provide associated references for further reading, including notes, papers and textbooks.

# **Assessment Methods**

The first part of the course (including section 1-4) is examined in three ways: Class participation (10%)+Assignments (20%)+Midterm exam (70%).

The second part of the course (including section 5-6) is examined in three ways: Class participation (10%)+Assignments (20%)+Final exam (70%).