

Time Series Econometrics

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Course Outline

The course will introduce students to the main issues arising when modeling Time Series Data. The class will provide students with the tools to apply some of the most sophisticated and up to date techniques used in empirical time series analysis. The students will also be exposed to brief sketches of the theoretical econometric issues behind some of the more recent developments in this field. At the end of the course the students will be able to read and understand applied papers on time series analysis, will have all the tools to estimate univariate and multivariate ARMA models, and will know where to look for more in depth theoretical research.

The topics covered in this course include univariate ARMA models, structural breaks testing, ARCH and GARCH, multivariate (VAR and SVAR) models, unit roots and cointegration.

Each topic will be motivated with an empirical example and hands on examples will be used throughout the class. Grading will be based on a final individual project.

Schedule

1. The main characteristic of Time Series Data. A look as some commonly used macro data.
2. Univariate Time Series Models:
 - MA, AR and ARMA: definitions and properties.
 - Model selection and estimation.
 - Tests for structural breaks.
3. Time Series Forecasting.
4. Non stationary models:
 - The trend versus unit root debate.
 - Unit Root Tests
5. Multivariate Models
 - a. VAR models
 - b. Structural VARs and identification issues
6. Cointegration
7. ARCH and GARCH

Readings

We will combine information from different sources for this class. Here are some useful readings to have:

James Hamilton, "Time Series Analysis" is a comprehensive book on Time Series Analysis. It is a great reference book.

Carlo Favero, "Applied Macroeconomics," a quick review of most topics encountered by applied macroeconomists.

Helmut Lutkepohl, "New Introduction to Multiple Time Series Analysis." This is the most comprehensive book on Time Series Analysis in a multivariate framework. This is an advanced book but a great reference to have.