Economic Data Analysis Using R

- Introduction to R
- Getting Started - Using Rstudio IDE
- Economic Data
- Data Visualization – Using Graphs
- Data Analysis I
- Data Analysis II

Economic Data

- Data Structure
  - Cross Sections
  - Time Series
  - Panel Data
- Data Size
  - High Frequency Financial Data
  - Massive Datasets (Big Data)
    - Public Administrative Data
    - Private Company Data

Economic Data

- Data Generating Process (DGP)
  - Economic Theory
  - Probability Distribution

$$uniform \quad f(x; \min, \max) = \frac{1}{\max - \min}, \ \min \leq x \leq \max$$

$$normal \quad f(x; \mu, \sigma^2) = \frac{1}{\sqrt{2\pi\sigma^2}} \exp\left(-\frac{(x-\mu)^2}{2\sigma^2}\right), \ -\infty < x < \infty$$

$$binomial \quad f(x; n, p) = \binom{n}{x} p^x (1-p)^{n-x}, \ x = 0, 1, ..., n$$

$$possion \quad f(x; \lambda) = \lambda^x \frac{\exp(\lambda)}{x!}, \ x = 0, 1, 2, ...$$

$$...$$

Economic Data

- Data Structure
  - Cross Sections
  - Time Series
  - Panel Data
- Random Experiments of DGP

$$x_i \sim iid$$

$$x_t \sim arima$$

$$x_{it} \sim iid + arima$$

Cross Sectional Data

- ## [The Economist's Big Mac Price Index](#)

  The Big Mac index was invented by *The Economist* in 1986 as a lighthearted guide to whether currencies are at their "correct" level. It is based on the theory of purchasing-power parity (PPP), the notion that in the long run exchange rates should move towards the rate that would equalize the prices of an identical basket of goods and services (in this case, a burger) in any two countries.

  - Find the data for July 2015 over 58 countries
  - Read the data (from Excel spreadsheet)
  - Summarize the data

Time Series Data

- Big Mac Price Index (Continued)
  - Find the data for US, from 1986 to 2015, unequal-spaced
  - Find the data for China, from 1996 to 2015
  - Read the data (from multiple Excel spreadsheets)
  - Summarize and compare

Time Series Data

- ## Consumer Sentiment (University of Michigan)

- A statistical measurement and economic indicator of the overall health of the economy as determined by consumer opinion. Consumer sentiment takes into account an individual's feelings toward his or her own current financial health, the health of the economy in the short term and the prospects for longer term economic growth.

- University of Michigan Surveys of Consumers is a consumer confidence index published monthly by the University of Michigan. The index is normalized to have a value of 100 in December 1964. Each month at least 500 telephone interviews are conducted of a continental United States sample (Alaska and Hawaii are excluded). Fifty core questions are asked.

- Data Exploration

Panel Data

- Big Mac Price Index (Continued)
  - Find the data for all available countries, from all available years until 2015, unequal-spaced and unbalanced
  - Read the data (from multiple Excel spreadsheets)
  - Summarize the data

High Frequency Financial Data

- Stock Market Daily Time Series
  - S&P 500, VIX (Fear Index)
  - International Stock Markets
- Ticker Data
  - Apple Co. (AAPL)
- On Line Data Resources
  - quantmod
  - Quandl

Massive Datasets (Big Data)

- Public Administrative Data
  - [Government Open Data](#)
  - [College Scorecard Data](#)

- Census Data
  - [Analyze Survey Data for Free](#)
  - [American Fact Finder](#)
  - [American Community Survey (ACS)](#)
    - [Public Use Microdata Sample (PUMS)](#)

Massive Datasets (Big Data)

- Company Data
  - [AmEx Credit Scoring](#)

  - [Wine Sales in Vancouver BC](#)

  - [Google Public Data](#)

  - [Amazon AWS Public Data](#)

  - [Kaggle Datasets](#)
    - [Walmart Retail Sales](#)

    - [ACS 2013](#)

    - [College Scorecard](#)