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# ECON 613: Applied Econometrics

## Introduction

# Objectives

- ▶ Present a set of models to understand, evaluate and predict the behaviour of economic agents.
  - ▶ Why?
  - ▶ How?
  - ▶ What?
- ▶ Model Selection.
- ▶ Implementation.
- ▶ Interpretation.

# Program

- ▶ Methods
  - ▶ Maximum Likelihood Estimation Techniques
  - ▶ GMM
  - ▶ Numerical Optimization
  - ▶ Bootstrap
- ▶ Methods for cross section data.
- ▶ Panel data analysis
- ▶ Treatment Evaluation
- ▶ Semiparametric Methods (Time)

## Method

- ▶ Final objective is to be able to carry out economic research using a “commercial”, push button software i.e. Stata
- ▶ My objective is to make sure that students understand what goes on behind the black box. As a consequence, you won't be doing any stata before the last two sessions of the class.
- ▶ Instead econometrics models will be computed using matrix based languages like R and Matlab.

# Organization

- ▶ Class time
- ▶ Office hours: Email appointment
- ▶ TAs:
  - ▶ Elessar Chen: [elessar.chen@duke.edu](mailto:elessar.chen@duke.edu)
  - ▶ Zhangchi Ma: [zhangchi.ma@duke.edu](mailto:zhangchi.ma@duke.edu)
- ▶ Questions?

## Evaluation (1): Problem sets (individual)

- ▶ Data Manipulation (R/Stata/...)
- ▶ OLS (Matlab/R)
- ▶ Discrete Choice (Matlab/R)
- ▶ Limited Dependent Variables (Matlab/R)
- ▶ Panel Data (Matlab/R)
- ▶ Recap (Stata)

## Evaluation (2): Reading notes

- ▶ Motivation.
- ▶ How: Which models? Which specification? Measurement issues.
- ▶ Findings. Re-interpretation.

## Evaluation (2): Reading notes (individual)

- ▶ Gender Gaps in Performance: Evidence from Young Lawyers (Azmat & Ferrer)
- ▶ Bargaining, Sorting, and the Gender Wage Gap: Quantifying the Impact of Firms on the Relative Pay of Women (Card, Cardoso & Kline)
- ▶ Children and Gender Inequality: Evidence from Denmark (Kleven, Landais & Sogaard)
- ▶ Gender Identity, Relative Income Within Households: (Bertrand, Kamenica & Pan)
- ▶ Selection, Investment, and Women's Relative Wages over Time (Mulligan & Rubinstein)



## Evaluation (3): Research Proposal (groups of 2 or 3)

- ▶ Topic on gender.
- ▶ Ideal data and Model.

## Details

- ▶ Github
- ▶ Learn about R and Matlab
- ▶ Reference: A. Colin Cameron and Pravin K. Trivedi (2005), Microeconometrics: Methods and Applications, Cambridge University Press.

