

# ECONOMETRICS: AN INTRODUCTION



University of  
Massachusetts  
Amherst BE REVOLUTIONARY™

# **WHY ECONOMETRICS? REFLECT AND WRITE!**

## **Write down**

1. One thing you expect to learn in this course.
2. One question you would like to be able to answer using Econometrics.

# WHY ECONOMETRICS?

**Now find a person next to you and ask the following:**

1. Name (and what they like to be called)
2. Where they're from
3. What their major is
4. What they wrote down

**Share!** Now please tell us these four things *about your neighbor.*

# MY TURN...

I come from Rome, Italy



I would like to use  
econometrics to learn the  
economic impacts of policies to  
reduce poverty.



# WHAT IS ECONOMETRICS?

- The art of analyzing data to learn about the world.
- Testing theories.
- Evaluating the effect of policies.
- Causal inference.
- Prediction.

# CAUSAL INFERENCE FOR POLICY EVALUATION: THE EFFECT OF MINIMUM WAGES

- 138 state-level MW changes in 1979-2016.
- Cengiz et al (2019) collect data on all of them.
- Calculate the average % change in the number of jobs *at each point of the wage distribution*.
- They find no *net* job losses:
  - Increase in jobs paying  $\geq$  MW offsets decrease in jobs paying  $<$  MW.
- Takeaway: MWs increase earnings and don't significantly decrease employment.

EFFECT OF MINIMUM WAGES ON LOW-WAGE JOBS

1423

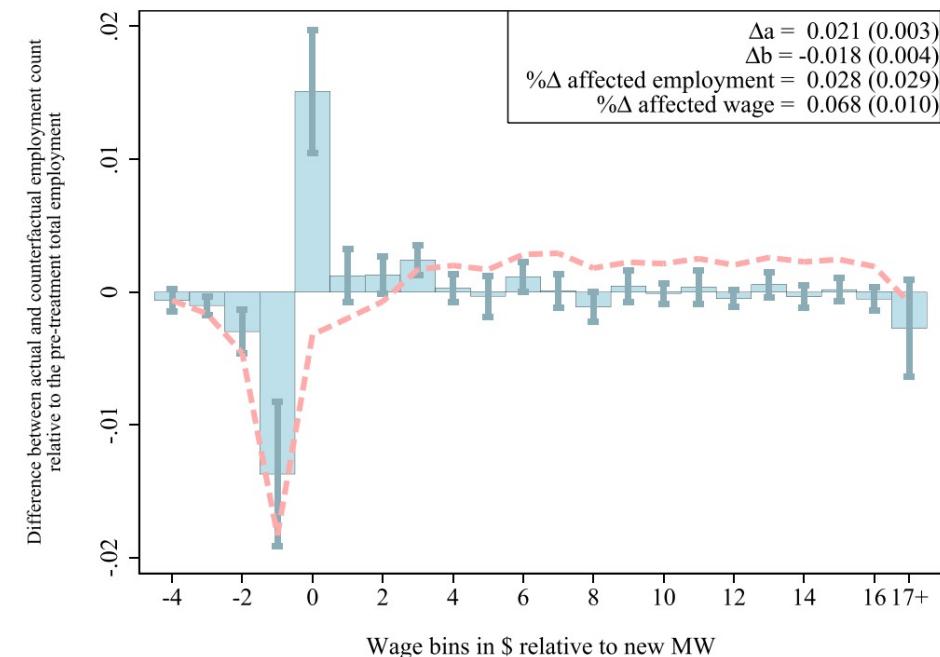


FIGURE II  
Impact of Minimum Wages on the Wage Distribution

The figure shows the main results from our event study analysis (see [equation \(1\)](#)) exploiting 138 state-level minimum wage changes between 1979 and 2016. The blue bars show for each dollar bin (relative to the minimum wage) the estimated average employment changes in that bin during the five-year post-treatment relative to the total employment in the state one year before the treatment. The error bars show the 95% confidence interval using standard errors that are clustered at the state level shown using the error bar. The dashed red line (color version available online) shows the running sum of employment changes up to the wage bin it corresponds to.

# ESTIMATING THE EFFECT OF FISCAL POLICY

- Do increases in government spending boost or harm growth?
- Problem: the government increases spending during recessions!
- A possible solution: study the effect of war-related spending.
- A version of it: look at States which produce military equipment (eg California) vs States that don't (eg Illinois).
- Results mostly suggest that government spending boosts GDP growth.

# THE EFFECT OF IMMIGRATION ON THE LABOR MARKET

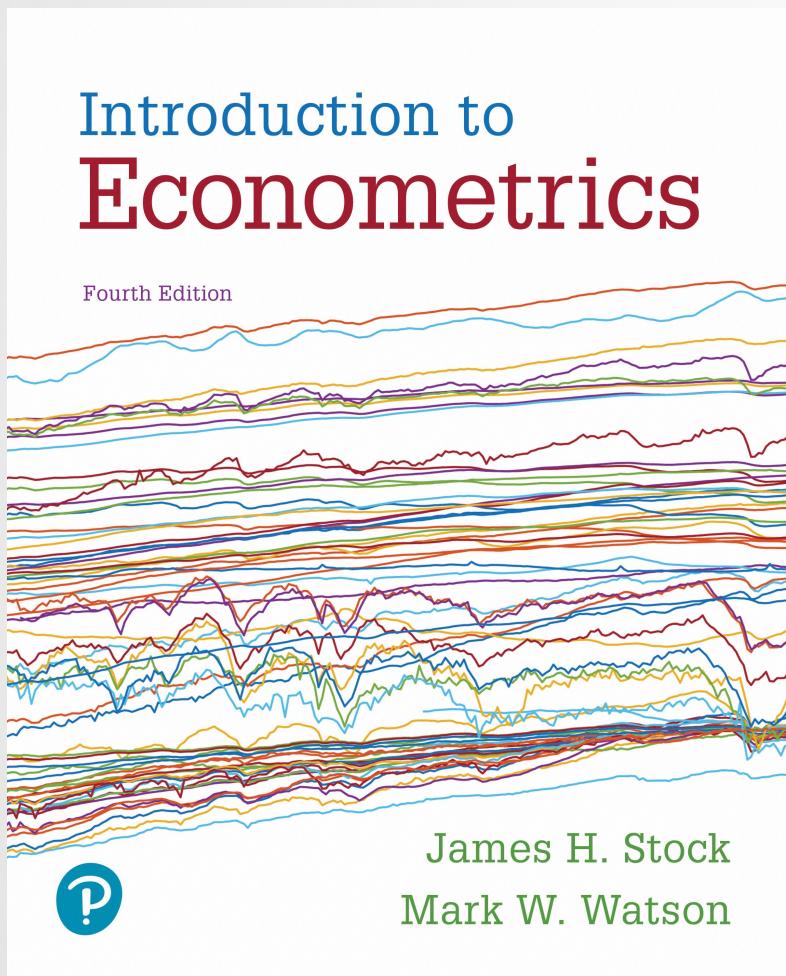
- Does immigration lower wages for native workers?
- Can't just look at places with many vs. few immigrants.
- Classic study (Card, 1990): the effect of the 1980 Mariel Boatlift.
- 125,000 Cuban immigrants suddenly allowed to migrate to Florida.
- Wages and unemployment did not change in Miami relative to similar cities in other States (ATL, HOU, LA, TPA FL).



# TYPES OF ECONOMIC DATA

- Experimental vs. Observational Data
- Cross-Sectional.
  - “Screenshot” of different entities in a single time-period.
- Time-Series.
  - A single entity followed for multiple time-periods.
- Panel (or longitudinal)
  - Multiple entities followed for two or more time periods.

# COURSE TEXTBOOK

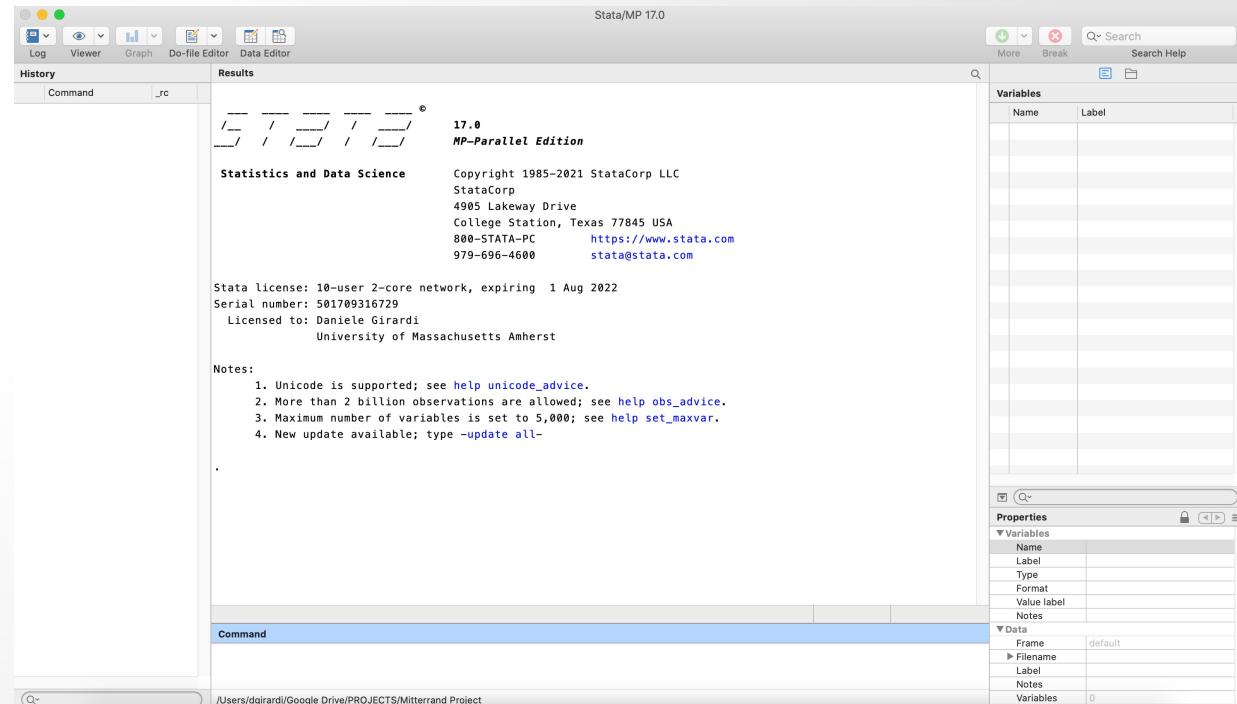


**Introduction to Econometrics  
(4<sup>th</sup> Edition)**  
by James H. Stock & Mark W.  
Watson

# STATISTICAL SOFTWARE

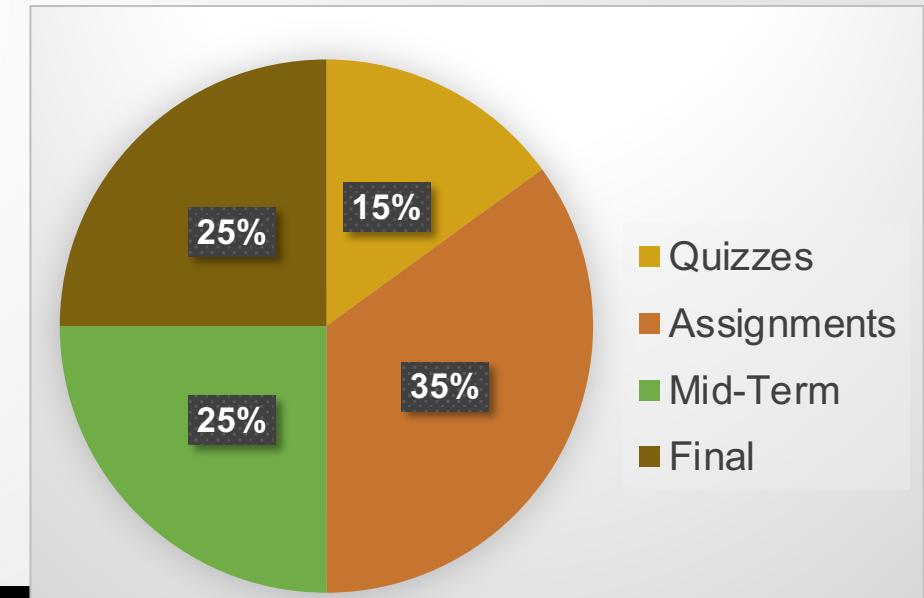
- Will be taught in lab sessions.
- ISSR also offers consultation  
<https://www.umass.edu/issr/what-we-do/consultation>
- Access it for free on your computer using **Azure Virtual Desktop (AVD)** (also known as Windows Virtual Desktop).
- Request access from this link:  
<https://www.umass.edu/it/computer-classrooms/windows-virtual-desktop>
- Lots of online resources:
  - Google your questions!

## STATA



# COURSE REQUIREMENTS & GRADING

- 12 weekly reading-based quizzes [15% of your grade].
- 4 take-home (post-lecture) assignments [35%]
- Mid-term exam in class [25%]
- Final Exam [25%]



# LAB SESSIONS

- Will be led by our TA Baris Guven.
- Friday 10:10 - 12:05 in Library Tower room 1667.
- Review key concepts, learn STATA, do exercises.
- Don't miss them!

