ECON 340 Economic Research Methods

Div Bhagia

Lecture 1: Introduction

So many questions...

Always have questions that need answers

- Do electric vehicle subsidies impact prices?
- Does the use of phones inhibit classroom learning?
- Is there racial discrimination in the labor market?
- Does raising interest rates lead to inflation?
- Who will win the next US election?

Quantitive Empirical Research

- A *research question* is any question you plan to answer by conducting research
- *Empirical research* is based on real-world observations
- *Quantitative empirical research*: empirical research that uses quantitative measurements
- In this class, we will learn to answer a research question using quantitative empirical research

Quantitive Empirical Research

Everyone is using it (for good reason)

- Economists, other social scientists
- Think tanks, governments, policymakers
- Businesses

Our world is becoming more and more data-oriented.

Most used words in economic papers

1970s

inflation distribution welfare value capital optimal long risksize iob eco rateIncome prowth taxefficie exchange ē Ĕ rade ana IVSIS Ĕ,Ĕ effect labor deman public rates information

1990s

rates competition effect models investmentstock ^{tax}statespolicy behavior change cycle pricestrade theory effects data SIS ence ita public socia ז_arket đ returns business model je human equilibrium debt income study structure estimates

2010-2015

institutions developmentimpact teacher change gender incentives growth consumer regulation 愛 Biong insurance jobeflect supply school 會 任 愛 costs preferences monetary E capitalunited economic choice quality eshocks labor rade social eory price risk effects critine experiment policy credit role cycle real markets financial business china firm run usingexperimental product behavior productivity competition inequality origins information approach auctions international learning selection exchange technology

This Course

Introduce you to tools used in quantitative research

Main goals:

- Understand statistical and econometric methods
- Be able to implement these methods in R
- Carry out a research project

Course Components

- Active Engagement (10%)
- Problem Sets (20%)
- Research Paper: Interim Submissions (15%)
- Research Paper: Final Submission (15%)
- Midterm (20%)
- Final Exam (20%)

Research Project

- As a part of this class, you will write an empirical research paper using *R*
- You will pick a question and a dataset and use the tools from this class to answer your question
- You can pick a dataset from the list of datasets provided on the course website or use an external dataset
- If you pick an external dataset, please run it by me well in advance of your submissions so I can make sure it works

Research Project: Dates

- Feb 6: Pick your partner
- Feb 25: First submission worth 5% (pick dataset and question)
- March 18: Feedback on your research question
- April 8: Second submission worth 10% (preliminary analysis)
- May 6: Final paper due worth 15%

Introductions

- preferred name and pronouns
- major and year at CSUF
- what is your comfort food?
- what do you want to get out of this class?

Who likes greek letters?

Summation Notation

$$\sum_{i=1}^{N} X_i = X_1 + X_2 + \dots + X_N$$

Example:

$$X = \{2, 9, 6, 8, 11, 14\}$$

$$\sum_{i=1}^{4} X_i = X_1 + X_2 + X_3 + X_4 = 2 + 9 + 6 + 8 = 25$$

Summation Notation

Another way of using a summation sign is to write



which refers to summing up all elements in A.

To sum up x for all possible values x, we can simply write



Things you CAN do

1. Pull constants out of or into the summation sign.

$$\sum_{i=1}^N bX_i = b\sum_{i=1}^N X_i$$

Things you CAN do

2. Split apart (or combine) sums (addition) or differences (subtraction)

$$\sum_{i=1}^{N} (bX_{i} + cY_{i}) = b \sum_{i=1}^{N} X_{i} + c \sum_{i=1}^{N} Y_{i}$$

Things you CAN do

3. Multiply through constants by the number of terms in the summation

$$\sum_{i=1}^{N} (a+bX_i) = aN + b\sum_{i=1}^{N} X_i$$

Things you CANNOT do

1. Split apart (or combine) products (multiplication) or quotients (division).

$$\sum_{i=1}^{N} X_i Y_i \neq \sum_{i=1}^{N} X_i \times \sum_{i=1}^{N} Y_i$$

Things you CANNOT do

2. Move the exponent out of or into the summation.

$$\sum_{i=1}^{N} X_i^a \neq \left(\sum_{i=1}^{N} X_i\right)^a$$

Things To Do Until Next Class

- 1. Review the syllabus carefully
- 2. Make sure you can access the Canvas page and the course website
- 3. Install R and R Studio on your computer (instructions on the course website)
- 4. Work on Class Handout 1
- 5. Start looking for potential research partners