ECON 340
Economic Research Methods

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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

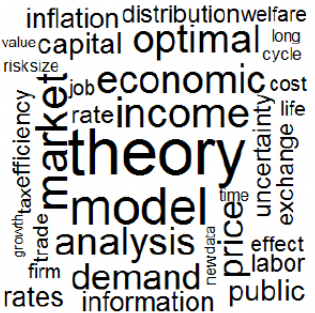
Everyone is using it (for good reason)

- 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



1990s

2010-2015

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

- Sep 5: Pick your partner
- Oct 1: First submission worth 5% (pick dataset and question)
- Oct 22: Feedback on your research question
- Nov 5: Second submission worth 10% (preliminary analysis)
- Dec 10: 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

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

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

$$\sum_{x \in A} x$$

which refers to summing up all elements in A.

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

$$\sum_{x} x$$

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