

1. Introduction:

The Role of Data and Empirical Analysis in Economics

Readings: Lecture Notes

An introduction to the course, including some background on the role of empirical analysis in understanding economic models of the economy.

A) *Why Study Statistics and Empirical Analysis*

What words come to mind when you think of statistics?

- Sadistics?
- My experience with stats and econometrics.

Brainstorming.

- Why do we study statistics and other empirical analysis in Economics?
 - Why are you here? Why is this course required? What will you take away from it?
 - How do you think you might encounter statistics in your major?
 - Think of 3 ways you meet it in the media.

Answers we need to see:

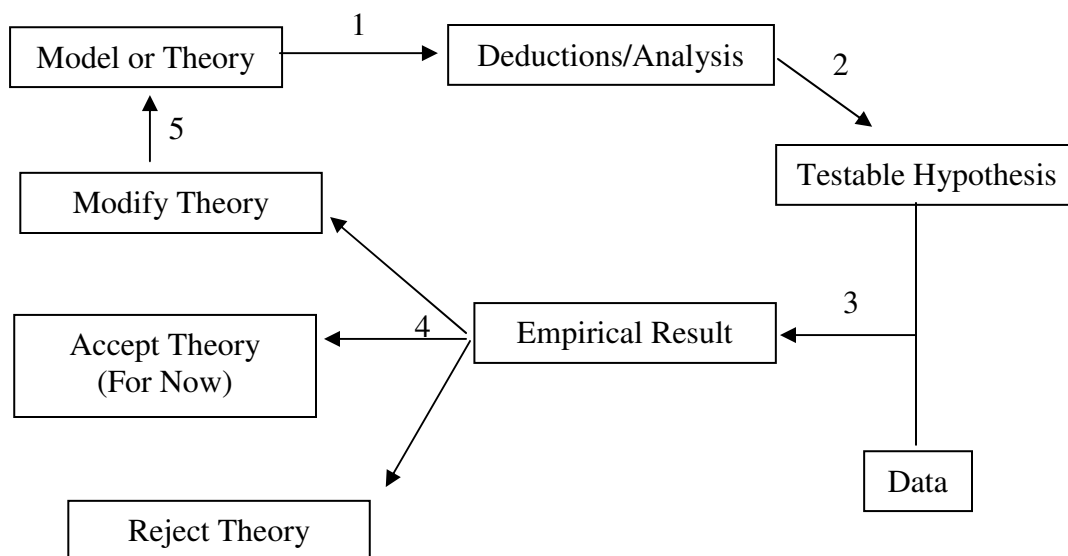
1. To get insight into economic variables, and how they behave.
2. Statistical literacy
 - To be able to understand when we are being misinformed (intentionally or otherwise) or lied to.
 - How much water do you need to drink?
 - Less than you think!! See the British Medical Journal article, <http://www.bmj.com/cgi/content/full/335/7633/1288>.
 - As we will discuss below, statistics is not just gathering and measuring facts.
 - Must be gathered and measured properly.
 - Must be interpreted/presented/received/understood/analyzed.
 - Mark Twain: "Lies, Damned Lies and Statistics".
 - Note the room for differences based on how data is gathered/measured and how it is analyzed.
 - Added bonus: being able to recognize b***s*** sports statistics.

3. To get stylized facts about the economy that our theories need to explain.



Source: The Economist

4. More deeply, to **test** our theories and policies. Economists must be able to do this.
- Brainstorm for a list of theories/policies and the implicit hypotheses that we might need to test.
 - Micro and Macro.
 - How hard will it be to test some of these?
 - Economic theories or models are not just opinions, but logic structures that flow from underlying principles incorporating stylized facts and empirical feedback.
 - Example: Phillips Curve.
 - Models can be detailed mathematics, or intuitive logic structure.
 - In both cases, they must be testable and tested empirically.
 - Basic structure of the Scientific Process:



B) *Why Study Excel*

- It is the standard in the working world –employers expect you to leave with it.
 - The Coop experience.
- You will be able to use it in other courses.
- It will help you to improve your overall analytical and computer skills.
- Excel's data manipulation is great, and its basic statistical package is pretty good.
 - If you go on to ECON 324, etc., you will use more specialized packages.

How many know lots of Excel? None?

- We will walk through some key points, but you must learn the basics yourself.
- Excel help will be on the webpage.
- It is integrated into the text and its exercises and its data CD.
- BUT, you must still get your own copy, or use the computers in the various labs around campus.
 - You must have the Analysis ToolPak Addin.

C) *Themes and Goals of The Course*

The goals of the course are outlined on page one of the syllabus.

- Goal: for you to be able to use data and statistics to improve your understanding of economics.
- We will explore the following themes in this course (which will be the individual pieces of what you would need to do on an empirical project):
 - How to find, evaluate the quality of, describe and present economic data.
 - Sections 2 and 3 (and also 9).
 - How to calculate various probabilities, and have some understanding of probability distributions.
 - Section 4.
 - How to relate sample data to the underlying population.
 - Section 5.
 - How to analyze the sample data: testing hypotheses about the economic variables, including relationships between variables and between different populations (inference).
 - Section 6.
 - How to use regression analysis to examine how economic variables can affect each other in complex manners. (This is the first step to econometric analysis, the heart of empirical economics, which is analysed in depth in ECON 324.)
 - Sections 7 and 8.
 - How to understand data when it is presented to you (looking for exaggerations and miscommunication), and how to properly present data and your analysis of the data.
 - Section 9
 - How to use Excel to aid you in doing the above tasks.

The emphasis will be on learning some tools that can be applied to answer various questions.

Key concept: lay out the steps of how to carry out an empirical project via the assignments.

- Establishing a theoretical question and specific hypotheses.
- Gathering and evaluating data, and summarizing it.
- Evaluating your sample selection.
- Specific hypothesis testing, including:
 - Comparing sample means to each other
 - Comparing sample means versus theoretical values
 - Testing causal relationships between variables via regression analysis.
- Writing up your results:
 - Are they statistically significant?
 - Are they economically significant?
 - What does they say about our model?
 - What do they say about the economy and our policies?

D) Survey of Student Characteristics and Opinions

- So, how useful was this survey in finding out the opinions of:
 - Students across the country?
 - U of R students?
 - U of R economics students?
 - Students in this class?
- Issues to think about:
 - Representative sampling.
 - Good questions that draw out what we are actually looking for.
 - Recall abilities of students.

Data is not just lying on the ground waiting for us to pick it up?

We will return to the data from these surveys throughout the year.

E) Next Step

Time to learn about data:

- Types of data.
- What are and where are the reliable and usable economic data sources.
- Hints of what to do with data.