

Microeconomics

Chapter 2:
Economic
Methods and
Economic
Questions

Acemoglu Laibson List

Modified by Joseph Tao-yi Wang

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Chapter Outline

- 2.1. The Scientific Method
- 2.2. Causation and Correlation
- 2.3. Economic Questions and Answers

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Key Ideas

1. A **model** is a simplified description of reality.
2. Economists use **data** to evaluate the accuracy of models and understand how the world works.
3. Correlation **does not imply** causality.

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Key Ideas

4. **Experiments** help economists to measure cause and effect.
5. Economic research focuses on questions that are **important to society** and **can be answered** with models and data.

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Evidenced-Based Economics Example



Is College Worth It?

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The Scientific Method

The scientific method (also referred to as empiricism) is composed of two steps:

1. Developing **models** that explain some part of the world
2. Testing those models using **data** to see how closely the model matches what we actually observe

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The Scientific Method - Models and Data



What is this?
Does it look like anyone you know?

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Model

A simplified description of reality

Is this an airplane?



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What's the shortest distance between two points?



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The Scientific Method - An Economic Model

- ▶ Evidenced-Based Example:
- ▶ Returns to education
- ▶ **Assumption**—one more year of education results in a **10% increase** in future earnings

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- ▶ Returns to education:
- ▶ If you would earn **\$15.00** per hour with **12** years of education, with one more year of education (your **first year** of college) you would earn:

$$\$15 \times 1.10 = \$16.50$$

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- ▶ Returns to education:
- ▶ If you would earn **\$16.50** per hour with **13** years of education, with one more year of education (**second year** of college), you would earn:

$$\$16.50 \times 1.10 = \$18.15$$

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- ▶ Returns to education:
- ▶ The **third** year: $\$18.15 \times 1.1 = \19.97
- ▶ The **fourth** year: $\$19.97 \times 1.1 = \21.97

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- ▶ Returns to education:
- ▶ **Hypothesis:**
- ▶ Getting a college degree (years 13-16) increases wages from \$15 to \$21.97, or 46.5%

$$[(\$21.97 - \$15)/\$15] = .4647$$

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- ▶ Two important features of models:
1. They are **not exact**. Not everyone will see his or her wages increase by 10% with every additional year of education
 2. They generate **predictions** that can be tested with data

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- ▶ **Hypothesis:** Each additional year of education increases wages by 10%
- ▶ True or False?



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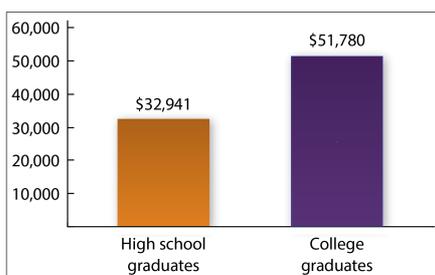


Exhibit 2.3 Average Annual Earnings of 30-Year-Old Americans by Education Level (2013 data)

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- ▶ How much higher is the wage for college graduates than for high school graduates?
 - ▶ College = \$51,780
 - ▶ High School = \$32,941
 - ▶ College results in a wage that is 57% higher.
- $$\frac{\$51,780}{32,941} = 1.57$$
- ▶ Model predicted 1.46 (46% higher).
 - ▶ Is that close enough?

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- ▶ If college graduates earn, on average, \$51,780/year, does that mean that all college graduates earn that much?

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- ▶ Can Steve Jobs or Bill Gates make you rich?
 - ▶ Adding them raises average income, but...



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- ▶ Speaking of Steve Jobs and Bill Gates...
 - ▶ How does their level of education affect their income?



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Causation and Correlation



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Causation and Correlation

Causation: When one thing directly affects another

- ▶ Example: pulling an all-nighter will make you tired

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Causation and Correlation

Correlation: When two things are related

- ▶ **Positive correlation** – they both change in the same direction
- ▶ **Negative correlation** – they change in opposite directions
- ▶ Example: shorter skirt lengths are associated with good economic conditions

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Causation and Correlation

- ▶ Why isn't correlation the same thing as causality?
- 1. **Omitted variables**
- ▶ If we ignore something that contributes to cause and effect, then that something is an omitted variable.
 - ▶ A correlation might not make sense until the omitted variable is added.

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Causation and Correlation

- ▶ Why isn't correlation the same thing as causality?
- 2. **Reverse causality**
- ▶ Reverse causality is when there is cause and effect, but it goes in the opposite direction as what we thought.
 - ▶ Example: gambling and healthier older people

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Causation and Correlation

- ▶ How can we tell the difference between causality and correlation?
- ▶ **Experiments**
- ▶ **Controlled** = subjects are randomly put into treatment (something happens) and control (nothing happens) groups by the researcher.
 - ▶ Problem: difficult to do with economics studies

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Causation and Correlation

- ▶ How can we tell the difference between causality and correlation?
- ▶ **Experiments**
- ▶ **Natural** = subjects end up in treatment or control groups due to something that is not purposefully determined by the researcher

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Causation and Correlation

- ▶ Evidence-Based Economics and Natural Experiments
- ▶ How much is an extra year of school worth?
- ▶ In 1947, the U.K. raised the minimum drop-out age from 14 to 15.
 - ▶ Those students reaching age 14 before 1947 = control group
 - ▶ Those students reaching age 14 in 1947 or after = treatment group

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2.3 Economic Questions and Answers

- ▶ Two Properties of a Good Economic Question:
 1. Relevant and important
 - ▶ Economic research contributes to social welfare
 2. Can be answered
 - ▶ Economic questions can be answered empirically
- ▶ Homework: ALL Chap.2, Problem 3, 6, 7, 8

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