Chapter 2: Economic Methods and Economic Questions

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.

Chapter Outline
1. The Scientific Method
2. Causation and Correlation
3. Economic Questions and Answers

Evidenced-Based Economics Example
Is College Worth It?

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

Experiments help economists to measure cause and effect.
Economic research focuses on questions that are **important to society** and can be answered with models and data.
What is this? Does it look like anyone you know?

What’s the shortest distance between two points?

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 = $16.50$

- 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 = $18.15$

Evidenced-Based Example:

- Returns to education
  - Assumption—one more year of education results in a 10% increase in future earnings
The Scientific Method - An Economic Model

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

Hypothesis:
- Getting a college degree (years 13-16) increases wages from $15 to $21.97, or 46.5% 
  
\[
\frac{(21.97 - 15)}{15} = .4647
\]

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

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

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

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

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

Causation: When one thing directly affects another
Example: pulling an all-nighter will make you tired

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
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.

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.

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

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

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