CHAPTER 2
Economic Models: Trade-offs and Trade
What you will learn in this chapter:

Why models?

- simplified representations of reality
  - production possibility frontier
  - comparative advantage
  - circular-flow diagram

Positive economics vs. normative economics

When economists agree and why they sometimes disagree.
Models in Economics:

A **model** is a simplified representation of a real situation that is used to better understand real-life situations.

The **production possibility frontier (PPF)** illustrates the trade-offs facing an economy that produces only two goods. It shows the maximum quantity of one good that can be produced for any given production of the other.
Tom’s Trade-offs: The Production Possibility Frontier

Feasible and efficient

Feasible but not efficient

Not feasible

Production possibility frontier PPF
Increasing Opportunity Cost

Producing the first 20 fish...

...requires giving up 5 coconuts.

But producing 20 more fish...

...requires giving up 25 more coconuts.
Economic growth results in an *outward shift* of the PPF because production possibilities are expanded.
Comparative Advantage and Gains from Trade
Ex.: Tom and Hank

(a) Tom’s Production Possibilities

(b) Hank’s Production Possibilities
Tom and Hank’s Opportunity Costs of Fish and Coconuts

<table>
<thead>
<tr>
<th></th>
<th>Tom’s Opportunity Cost</th>
<th>Hank’s Opportunity Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>One fish</td>
<td>3/4 coconut</td>
<td>2 coconuts</td>
</tr>
<tr>
<td>One coconut</td>
<td>4/3 fish</td>
<td>1/2 fish</td>
</tr>
</tbody>
</table>

Both castaways are better off when they each specialize in what they are good at and trade.
Specialize and Trade

(a) Tom's Production and Consumption

- Tom's consumption with trade
- Tom's consumption without trade
- Tom's production with trade

(b) Hank's Production and Consumption

- Hank's production with trade
- Hank's consumption with trade
- Hank's consumption without trade

<table>
<thead>
<tr>
<th></th>
<th>Without Trade</th>
<th></th>
<th>With Trade</th>
<th></th>
<th>Gains from Trade</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Production</td>
<td>Consumption</td>
<td>Production</td>
<td>Consumption</td>
<td></td>
</tr>
<tr>
<td>Tom</td>
<td>28</td>
<td>28</td>
<td>40</td>
<td>30</td>
<td>+2</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>9</td>
<td>0</td>
<td>10</td>
<td>+1</td>
</tr>
<tr>
<td>Coconuts</td>
<td>8</td>
<td>8</td>
<td>20</td>
<td>10</td>
<td>+4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+2</td>
</tr>
<tr>
<td>Hank</td>
<td>6</td>
<td>6</td>
<td>0</td>
<td>10</td>
<td>+4</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>8</td>
<td>20</td>
<td>10</td>
<td>+2</td>
</tr>
</tbody>
</table>
Comparative vs. absolute advantage

**Comparative advantage:** the opportunity cost of producing the good is lower for that individual than for other people.

**Absolute advantage:** if he or she can do it better than other people.

**Careful:** Don’t confuse comparative advantage with absolute advantage!
Comparative Advantage and International Trade
Ex.: U.S. vs. Canadian Economy

The U.S. and Canada can both achieve mutual gains from trade.
The **circular-flow diagram** is a model that represents the transactions in an economy by flows around a circle.
Circular-Flow of Economic Activities

Economic Agents:

- Households
- Firms

Where they interact:

- Markets for goods and services
- Markets for factors of production
Growth in the U.S. Economy from 1962 to 1988

1962

- **Households**: 58 million workers, $0.36 trillion
- **Firms**: $0.38 trillion
- Markets for goods and services
- Factor markets

1988

- **Households**: 105 million workers, $3.36 trillion
- **Firms**: $3.53 trillion
- Markets for goods and services
- Factor markets
Using Models / Why economist (dis)agree?

- Positive economics
- Normative economics

A forecast is a simple prediction of the future.

There are two main reasons economists disagree:

- they may disagree about which simplifications to make in a model
- they may disagree about values
The End of Chapter 2

Coming attraction:
Chapter 3:
Supply and Demand

Do Chapter 2 Appendix before then!
Chapter 2 Appendix:
Graphs in Economics
Figure 2A-1 Plotting Points on a Two-Variable Graph

- **x-variable** (outside temperature)
- **y-variable** (number of sodas sold)

<table>
<thead>
<tr>
<th>Point</th>
<th>x-variable: outside temperature</th>
<th>y-variable: number of sodas sold</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0°F</td>
<td>10</td>
</tr>
<tr>
<td>B</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>C</td>
<td>40</td>
<td>30</td>
</tr>
<tr>
<td>D</td>
<td>60</td>
<td>50</td>
</tr>
<tr>
<td>E</td>
<td>80</td>
<td>70</td>
</tr>
</tbody>
</table>

- **y-variable** is the dependent variable.
- **x-variable** is the independent variable.

- **Origin** $(0, 0)$
- **A** $(0, 10)$
- **B** $(10, 0)$
- **C** $(40, 30)$
- **D** $(60, 50)$
- **E** $(80, 70)$

- **vertical axis or y-axis**
- **horizontal axis or x-axis**
Figure 2A-2  Drawing Curves

(a) Positive Linear Relationship

(b) Negative Linear Relationship
Figure 2A-3  Calculating the Slope
Figure 2A-4 (a-b) Nonlinear Curves

(a) Positive Increasing Slope

- \( \Delta y = 15 \), \( \Delta x = 1 \)
- Slope = 15
- Positive slope gets steeper.

(b) Positive Decreasing Slope

- \( \Delta y = 5 \), \( \Delta x = 3 \)
- Slope = \( 1^{\frac{2}{3}} \)
- Positive slope gets flatter.
Figure 2A-4 (c-d) Nonlinear Curves
Figure 2A-5 Calculating the Slope Using the Point Method
Figure 2A-6  Maximum and Minimum Points
Figure 2A-7 Time-Series Graph
Figure 2A-8 Scatter Diagram

Standard of Living and Average Life Expectancy

Life expectancy at birth (years)

Log GNP (per capita)
Receipts by Source for U.S. Government Budget 2003 (total: $1,782.3 billion)

- Corporation income taxes: 7%
- Social insurance receipts: 40%
- Individual income taxes: 45%
- Excise taxes: 4%
- Other: 4%
Changes in the Number of Unemployed by Race (2001–2002)

<table>
<thead>
<tr>
<th>Race</th>
<th>Percent change in number of unemployed</th>
<th>Change in number of unemployed</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>24%</td>
<td>1,168,000</td>
</tr>
<tr>
<td>Black or African-American</td>
<td>20%</td>
<td>277,000</td>
</tr>
<tr>
<td>Asian</td>
<td>35%</td>
<td>101,000</td>
</tr>
</tbody>
</table>
Figure 2A-11  Interpreting Graphs: The Effect of Scale