Scarcity and Production Possibilities

Economics 120: Global Macroeconomics

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1.1 Goals and Learning Objectives

Goals and Learning Objectives

- **Goals:**
  - Understand definition and goal of macroeconomics.
  - Understand scarcity and production possibilities.

- **Learning Objectives**
  - Learning Outcome (LO) 1: Apply the model of the production possibilities curve to illustrate the concepts of scarcity, choice, opportunity cost, and economic growth.
  - General Education Learning Outcome (GELO) 2: Enhance knowledge and abilities concerning critical and creative thinking.

Relevant Reading

- Introduction to Economics: Module 1
- Production possibilities: Module 3

2 What is Economics

2.1 Scarcity

What is economics?

- Economics is the study of the allocation of scarce resources.

- **Resource:** broadly defined as anything that is used in production or is consumed.

- **Scarcity:** a resource is considered scarce when there is not enough to satisfy everyone’s wants at a zero price.
• Microeconomics (ECO 110) studies how individual agents in the economy (consumers or producers) make choices with scarce resources.

• Macroeconomics studies how scarce resources move among groups of economics agents.

2.2 Factors of production

Factors of production

• Factors of production: scarce resources that are used in the production of goods.

• Land: any natural resource (such as land, forest, oil) that is used for production.

• Capital: equipment or machinery used in production of goods.
  – The process of producing or purchasing new capital goods is called investment.

• Labor: time people spend employed in producing goods, as well as the physical and mental talents of people.
  – Human capital: Mental talents of people used in production of goods.

Types of Efficiency

• Productive Efficiency: a good is produced at the lowest possible cost.

• Allocative Efficiency: the economy is using its scarce factors of production to produce the most of what its people want to consume.
  – This takes into account impact of current decisions on future production possibilities.
  – “Want to consume” is a broad term that can include things like enjoyment of a clean environment, protection of the world’s species, etc.

• Pareto Efficiency (aka Pareto optimal):
  – When no one else can be made better off without making someone worse off.
  – This is a weak measure of efficiency.
  – However, Pareto improvements should always be addressed.
3 Production Possibilities

3.1 Frontier

Production possibilities

- Many of the same factors of production can be traded between productions of alternative goods.
- Factors of production are scarce.
- Production possibilities: trade-off when producing two or more different goods.
- Assumptions:
  - Full employment and efficient use of all resources.
  - Single period in time → fixed resources and fixed technology.
  - Two goods. Not an essential assumption, just makes it easy to draw.

Production possibilities

<table>
<thead>
<tr>
<th>Type of Product</th>
<th>Production Alternatives</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td>Pizzas (in hundred thousands)</td>
<td>0</td>
</tr>
<tr>
<td>Robots (in thousands)</td>
<td>10</td>
</tr>
</tbody>
</table>

- Production possibilities table: pairs of quantities of two goods that can be produced.
- Production possibilities frontier: graph of production possibilities.
3.2 Opportunity costs

Opportunity costs

- Opportunity cost: amount of production of one good that must be given up to produce another good.
- Compute opportunity cost of pizzas.
- Is it always the same?

Opportunity costs

- **Law of increasing opportunity cost**: as you increase production of a good, the opportunity cost of producing the good increases.
- Slope of the curve is equal to the opportunity cost of the good on the x-axis.
- Increasing opportunity costs give the PPF the bowed outward shape.

3.3 Shifts in PPFs

Future PPFs

- If technology or quantity of resources change, the PPF will shift.
- Improvement in technology.
  - Shift PPF outwards.
  - Changes in technology can also change opportunity cost (and therefore the slope).
- Discovery of oil.
– Shift PPF outwards.
– May also change opportunity cost?

• Destruction of resources (eg: natural disasters, war).
  – Shift PPF inwards.
  – May change opportunity cost.

Example

• Suppose Florida can produce the following combinations of Oranges and Grape Jelly if it uses all its resources efficiently:

<table>
<thead>
<tr>
<th>Oranges</th>
<th>Jelly</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>30</td>
</tr>
<tr>
<td>2</td>
<td>28</td>
</tr>
<tr>
<td>4</td>
<td>24</td>
</tr>
<tr>
<td>6</td>
<td>18</td>
</tr>
<tr>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>10</td>
<td>0</td>
</tr>
</tbody>
</table>

• Graph the PPF. Label what is possible, but inefficient, efficient, and not possible.
• Does is bow outward, inward, or is it a straight line?

Example continued

• What is the opportunity cost of Oranges at each given level?
• What is the opportunity cost of grape jelly at each given level?
• Is the movement of opportunity costs consistent with the shape?
• Show what would happen if there was an excellent farming season that made all fruit crops very productive.
• Show what would happen if there was an overnight freeze that destroyed many orange crops.
  – Would Florida produce less oranges?
  – Would Florida produce less grape jelly?

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Coming up...

• Read 2002 WSJ Article: “Makeshift Cuisinart Makes a Lot Possible in Impoverished Mali”.
• Next topic: Supply and Demand
  
  – Learn how agents in an economy collectively “decide” how much of a good to produce, and how prices are determined.
  – Reading: Modules 5, 6, and 7.