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) 1: Students will be able to use mathematical and logical methods to solve problems.

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 scare resources move among groups of economics agents.

2.2 Way of Thinking

Tenets of Economics Thinking

- We (often) assume people are "rational".
  - People have some defined objective. Eg. maximize profits, maximize enjoyment from consumption (utility).
  - People make the best decision with the information they have available.
- People respond to incentives.
- It is useful to think about optimal decisions at the *margin*.
  - What is the *additional* revenue from producing *one additional* unit of a good?
  - What is the *additional* income from deciding to work *one additional* hour?

2.3 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

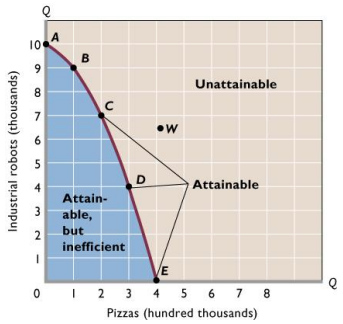
Production possibilities

- 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 2.1
Production Possibilities of Pizzas and Robots with Full Employment and Productive Efficiency

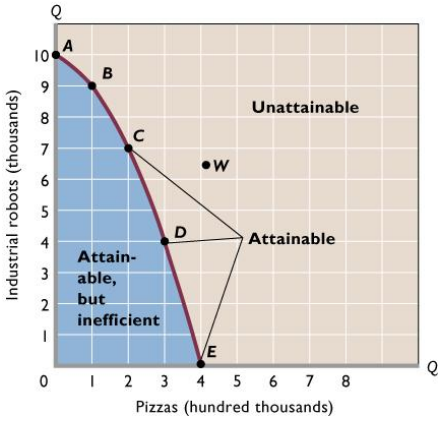
	Production Alternatives				
Type of Product	A	B	C	D	E
Pizzas (in hundred thousands)	0	1	2	3	4
Robots (in thousands)	10	9	7	4	0



- 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:

Oranges	Jelly
0	30
2	28
4	24
6	18
8	10
10	0

- 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.