

Chapter 1

Economics: The Study of Opportunity Cost

Learning Objectives

After reading this chapter you should be able to:

LO1 Define the key terms of economics and opportunity cost and understand how a production possibilities frontier exemplifies the trade-offs that exist in life.

LO2 Distinguish between increasing and constant opportunity cost and understand why each might happen in the real world.

LO3 Define economic growth and distinguish between specialized and generalized economic growth in the context of a production possibilities frontier.

LO4 Analyze an argument by thinking economically, while recognizing and avoiding logical traps.

Chapter Outline

- Economics and Opportunity Cost
- Modeling Opportunity Cost Using the Production Possibilities Frontier
- Attributes of the Production Possibilities Frontier
- Economic Growth
- The Big Picture
- Kick It Up a Notch: Demonstrating Constant and Increasing Opportunity Cost on a Production Possibilities Frontier

ECONOMICS AND OPPORTUNITY COST

- **Economics:** the study of the allocation and use of scarce resources to satisfy unlimited human wants
- **Opportunity cost**
 - The forgone alternative of the choice made

Teaching Tips

- 1) *Break out the definition word-by-word. (study, allocation, scarce, resources, unlimited, human wants)*
- 2) ***Let students discuss** the things they think are free (air, ocean water) and get them to see that fresh air and unpolluted ocean water are not free.*
- 3) *Use the definition to note that all economic systems (free markets, socialism, communism, etc.) must deal with scarcity.*
- 4) ***Let students discuss** what they would be doing were they not in class.*
- 5) ***Let students discuss** what they would be doing if they were not in college.*
- 6) *Note for them that irresponsible behavior and responsible behavior both have an opportunity cost.*
- 7) ***Let students discuss** the opportunity cost of going to college. Get them to see the opportunity cost of going to college includes both the tuition they pay as well as the income they forgo by being less able to work large numbers of hours.*

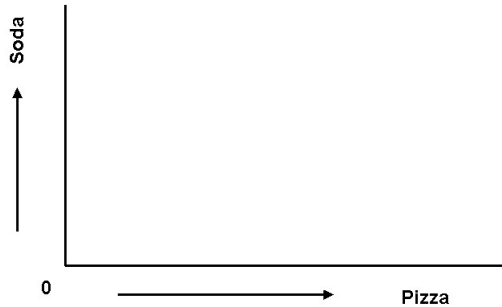
MODELING OPPORTUNITY COST USING A PRODUCTION POSSIBILITIES FRONTIER

- **PPF:** a graph which relates the amounts of different goods that can be produced in a fully employed society
- **Model:** a simplification of the real world that we can manipulate to explain the real world.
- **Simplifying assumption:** an assumption that may, on its face, be silly but allows for a clearer explanation
- **Scarce:** not a freely available and infinite
- **Resources:** anything we either consumer directly or use to make things that we will ultimately consume

Teaching Tip

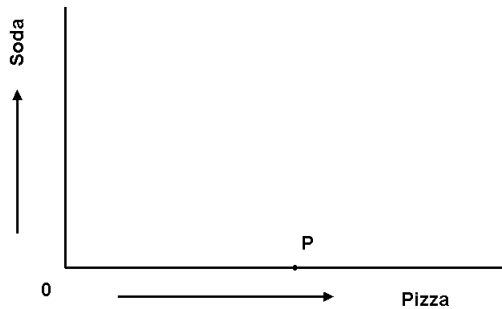
Let students discuss what distinguishes a good simplifying assumption from a poor one.

The Starting Point for a PPF



Drawing Tips

- 1) Use this as an opportunity to review the idea of graphing. (Students may not have had a math course in years and those who are math-phobic are often those who are econ-phobic.)
- 2) Draw the axes, labeling them and using the arrows to illustrate and emphasize the idea that moving further to the right implies more pizza is produced and moving higher means more soda is produced.

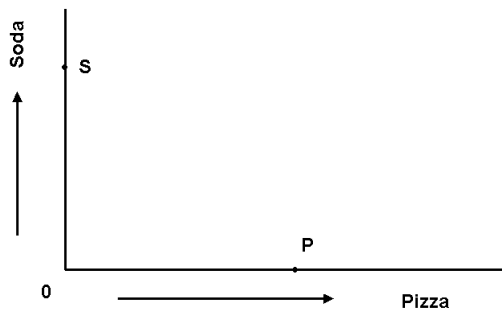


Drawing Tip

Add the point "P".

Teaching Tips

- 1) Note that this point represents the most pizza that can be produced.
- 2) Note that this is a finite amount.



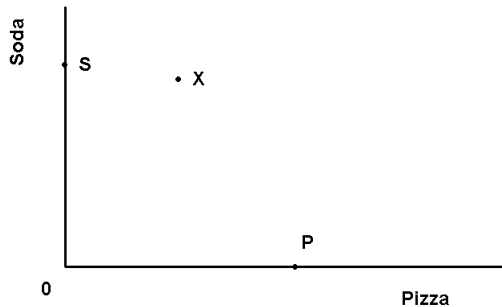
Drawing Tip

Add the point "S".

Teaching Tips

- 1) Note that this point represents the most soda that can be produced.
- 2) Note that this is a finite amount.

Points in Between the Extremes of a PPF

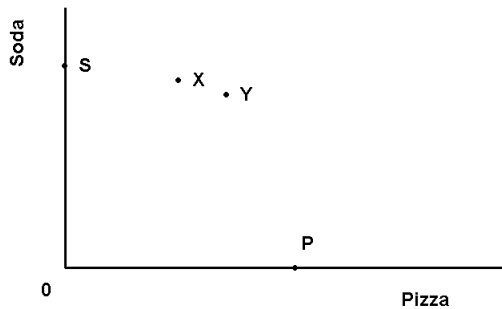


Drawing Tip

Put a point “X” that is around a third of the horizontal distance from the origin to point “P” and only a small distance vertically lower than point “S”.

Teaching Tip

Use the idea that the best person to switch from soda to pizza is the “pizza chef”.

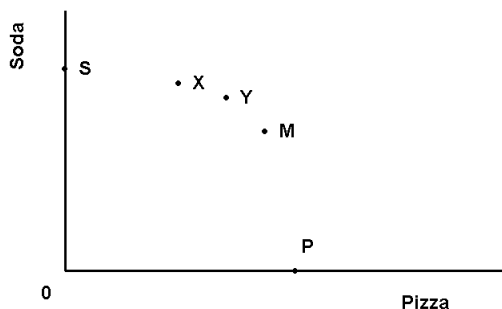


Drawing Tips

- 1) Put a point “Y” down and to the right of “X”.
- 2) Make sure the point represents more of a loss of soda than the change from “S” to “X” and less of a gain of pizza than from “S” to “X”.

Teaching Tip

Explain that the next best pizza maker/next worst soda maker is the best person to move next.

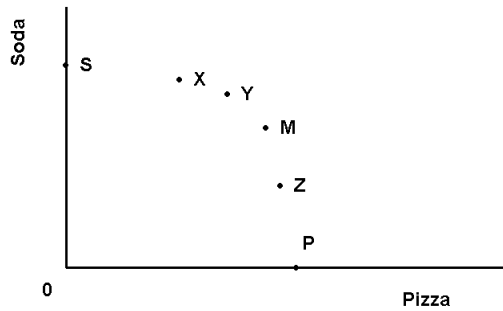


Drawing Tips

- 1) Put a point “M” down and to the right of “Y”.
- 2) Make sure the point represents more of a loss of soda than the change from “X” to “Y” and less of a gain of pizza than from “X” to “Y”.

Teaching Tip

Explain that the next best pizza maker/next worst soda maker is the best person to move next.



Drawing Tips

- 1) Put a point "Z" down and to the right of "M".
- 2) Make sure the point represents more of a loss of soda than the change from "Y" to "M" and less of a gain of pizza than from "Y" to "M".

Teaching Tip

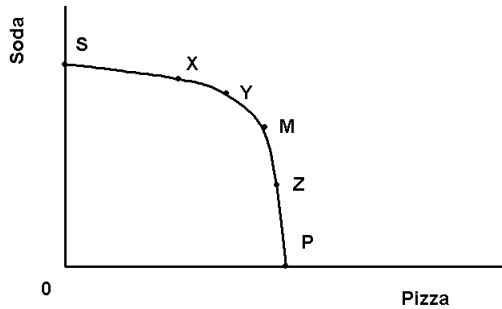
Explain that you could have gone the other way starting at point "P" and moving toward point "S".

ATTRIBUTES OF THE PRODUCTION POSSIBILITIES FRONTIER

A Fully Labeled Production Possibilities Frontier: The Case When People are Different

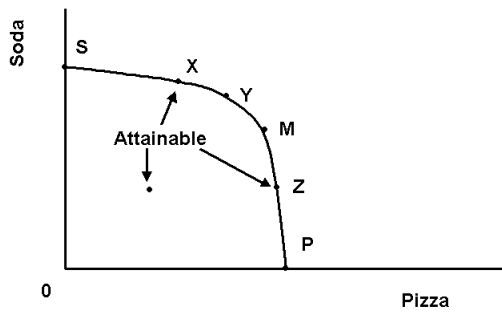
Drawing Tip

Connect the dots.



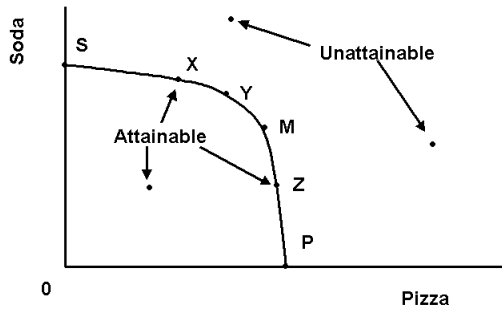
Teaching Tips

- 1) Note that points on the curve are attainable.
- 2) Note that points on the interior are also attainable.



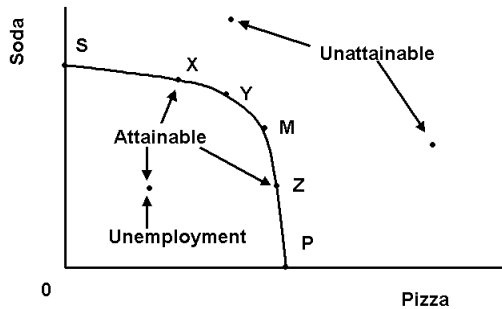
Teaching Tip

Note that points on the exterior are unattainable.

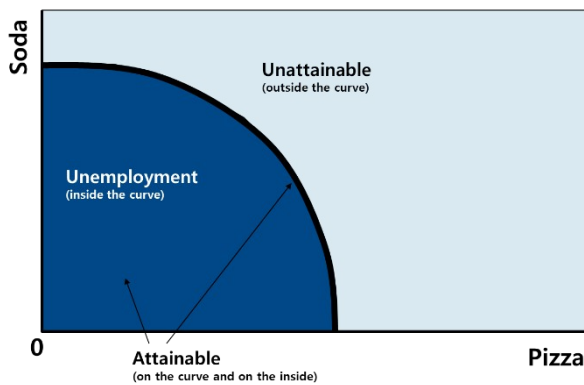


Teaching Tips

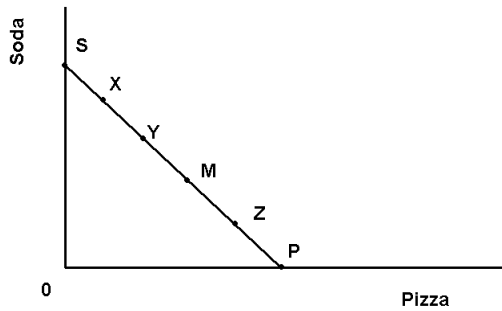
- 1) *Note that points on the interior are ones in which there is unemployment.*
- 2) *Note that more can be produced of either or both goods with the existing resources.*



ATTRIBUTES OF THE PRODUCTION POSSIBILITIES FRONTIER



A Fully Labeled Production Possibilities Frontier: The Case When People are the Same

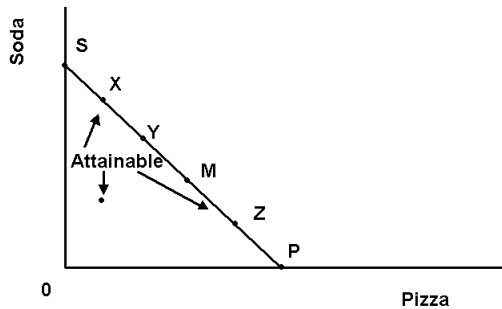


Drawing Tips

- 1) Draw each point one by one.
- 2) Explain the constancy of the loss of soda and gain of pizza as you progress from “S” to “P”.

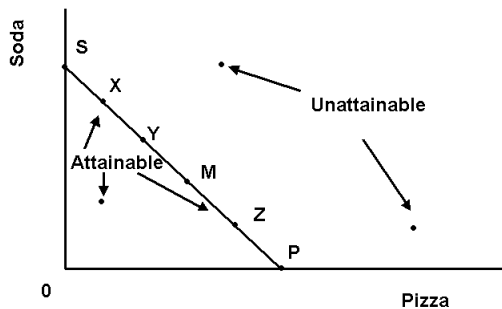
Teaching Tips

- 1) Give examples of situations where there is constant opportunity cost.
- 2) **Let students discuss** situations where they can see constant opportunity cost in the real world.



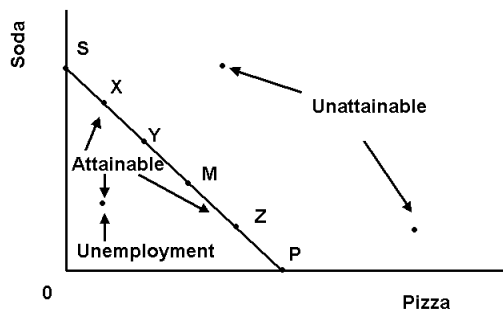
Teaching Tips

- 1) Note that points on the curve are attainable.
- 2) Note that points on the interior are also attainable.



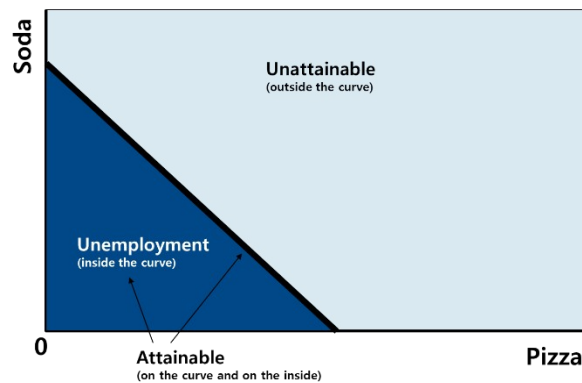
Teaching Tip

Note that points on the exterior are unattainable.



Teaching Tips

- 1) Note, just like the increasing opportunity cost case, that points on the interior are ones in which there is unemployment.
- 2) Note, just like the increasing opportunity cost case, that more can be produced of either or both goods with the existing resources.



Increasing and Constant Opportunity Cost

- **Increasing opportunity cost**
 - exists when the additional resources required to produce an additional unit grows as more output is produced.
 - likely to occur when people are different in their skills.
- **Constant opportunity cost**
 - exists when the additional resources required to produce an additional unit remains the same as more output is produced.
 - likely to occur when people are identical in their skills.

Teaching Tips

- 1) *Be sure to differentiate increasing opportunity cost with the level simply being greater. (The opportunity cost of producing 3 units of pizza is obviously greater than producing only 2, but the idea of increasing opportunity cost is that producing the third unit had a greater opportunity cost of producing the second.*
- 2) ***Let students discuss** the likelihood of finding increasing opportunity cost in the real world. Have them generate examples.*
- 3) ***Let students discuss** the likelihood of finding constant opportunity cost in the real world. Have them generate examples.*

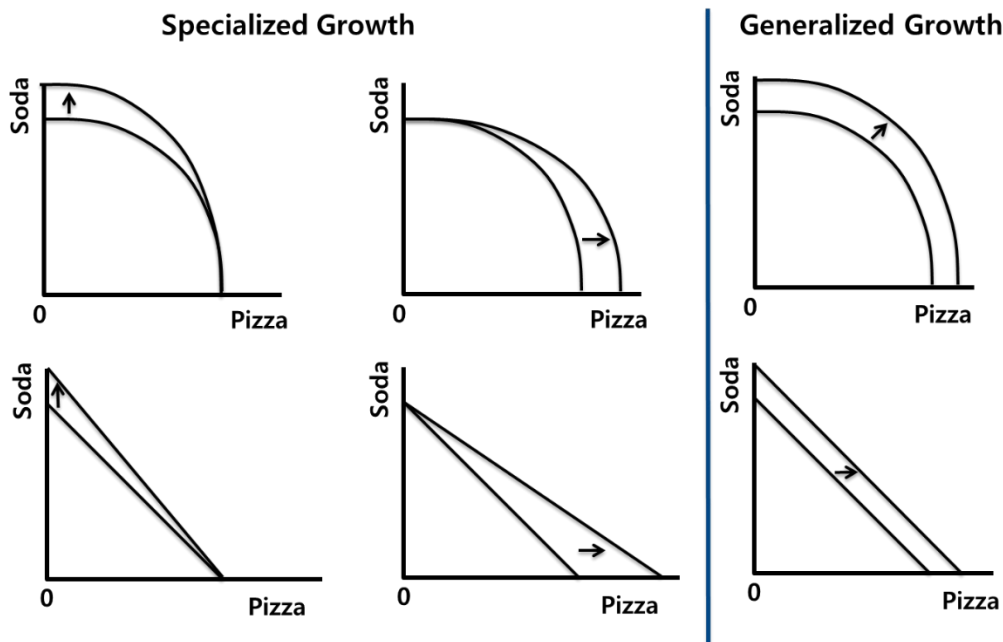
ECONOMIC GROWTH

- **Economic growth:** the circumstance where greater production opportunities exist.
- **Generalized growth:** an increase in, or an increase in the ability of, resources to produce all goods
- **Specialized growth:** an increase in the ability to produce a particular good because there is an increase in, or an increase in the ability of, resources to produce a particular good

Teaching Tip

Let students discuss by providing examples of technologies/innovations that would create generalized growth. Do the same for specialized growth. Have them indicate an example of an output and an innovation in combination. For instance, robotics would enable assembly-line production of cars but not the production of music. Computer software enhancements would impact both cars and music.

Modeling Specialized and Generalized Growth



Teaching Tip

Use the examples provided in the previous discussion to alter the axes labels and to tell the story.

Sources of Economic Growth

- Increase in the availability of resources
- Increase in the ability of resources

Teaching Tips

- 1) *This is an excellent time to discuss recent innovations like hydraulic fracturing (which increases the availability of energy) as opposed to increases in educational attainment (which increases the ability of resources).*
- 2) *A reference to Gordon's "Rise and Fall of American Growth" could be useful. Electric lighting had an impact of making more "time" available for production. Education makes labor more productive. The change in societal standards that increased the prevalence of women in the labor market is analogous to the increased accessibility of natural gas fields with hydraulic fracturing in that the resources were always there, they were just not utilized in production.*

THE BIG PICTURE

- **Circular flow model:** a model that shows the interactions of all economic actors
 - Markets are where the interactions take place.
 - Actors are the entities interacting.

Markets in a Circular Flow Diagram

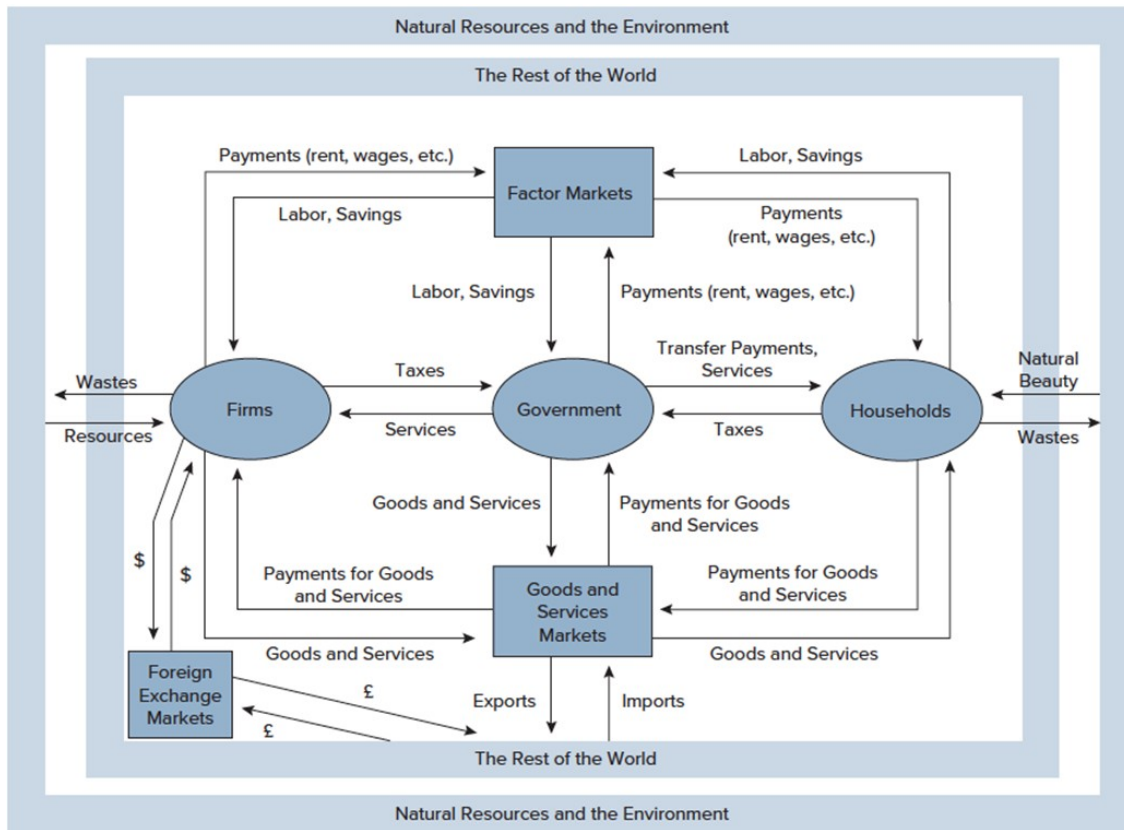
- **Market:** any mechanism by which buyers and sellers negotiate an exchange
- **Factor market:** a mechanism by which buyers and sellers of labor and financial capital negotiate an exchange
- **Goods and services market:** a mechanism by which buyers and sellers of goods and services negotiate an exchange
- **Foreign exchange market:** a mechanism by which buyers and sellers of the currencies of various countries negotiate an exchange

Actors in a Circular Flow Diagram

- Households
- Firms

- Government

The Circular Flow Diagram



Teaching Tip

In my mind, this is a topic that is either eminently skippable or worthwhile (but only when done well). It is way too complicated to do half-heartedly.

THINKING ECONOMICALLY

Marginal Analysis

- **Optimization assumption:** an assumption that suggests that the person in question is trying to maximize some objective
- **Marginal benefit:** the increase in the benefit that results from an action
- **Marginal cost:** the increase in the cost that results from an action
- **Net benefit:** the difference between all benefits and all costs

Teaching Tips

- 1) *Emphasize the importance of this concept as it will relate to companies choosing output, and people deciding how many goods to buy.*
- 2) *Referring to the GPA-Fun tradeoff (from Kick It Up a Notch, page 15), **let students discuss** the marginal benefit and marginal cost of studying on Thursday afternoon relative to Saturday night.*

Positive and Normative Analysis

- **Positive analysis:** a form of analysis that seeks to understand the way things are and why they are that way
- **Normative analysis:** a form of analysis that seeks to understand the ways things should be

Teaching Tips

- 1) *Give several examples of each type of analysis.*
 - a. *“How much the rich pay in federal taxes vs. how much they should pay.”*
 - b. *“What does welfare do to work incentives vs. should welfare recipients be forced to work.”*
- 2) *Give your own examples how economists could have disagreements regarding “positive” analysis. For instance, economists differ on the impact of the minimum wage frequently because they are using different methods of estimating the impact.*

Economic Incentives

- **Incentive:** something that influences the decisions we make

- Examples: prices influence the amount we buy; taxes influence how much we work and save

Correlation and Causation

- **Direct correlation:** A higher level of one variable is associated with a higher level of the other variable.
- **Inverse correlation:** A higher level of one variable is associated with a lower level of the other variable.
- **Causation:** A change in one variable makes another variable change.

Teaching Tip

Explain the difference between direct and inverse correlation.

- 1) *Direct Correlation: the statistical observation that when two variables vary together*
- 2) *Inverse Correlation: the statistical observation that when two variables vary in opposite directions*

Impediments to Thinking Economically

- **Fallacy of composition:** the mistake in logic that suggests that the total economic impact of something is always and simply equal to the sum of the individual parts
- **Correlation = causation:** the mistake that suggests that because two variables are correlated that one caused the other to happen

Teaching Tips

- 1) *Use the cake vs. the ingredients example in the text.*
- 2) **Let students discuss** to see if they can generate examples of their own.
- 3) *Give an example where correlation and causation ARE the same such as, “when you turn on the stove the element gets hot.”*
- 4) *Give an example where you give the reverse causation, “people swimming outside must make it hot.”*
- 5) *Given an example where they are NOT the same such as the weight-dates example in the book. This example also illustrates the “other missing variable issue”, that is age is correlated with both and age determines the frequency of dates for teens, not weight.*

Avoiding Mistakes in Thinking

One key to avoiding the mistake of equating correlation and causation is the construction of a counterfactual.

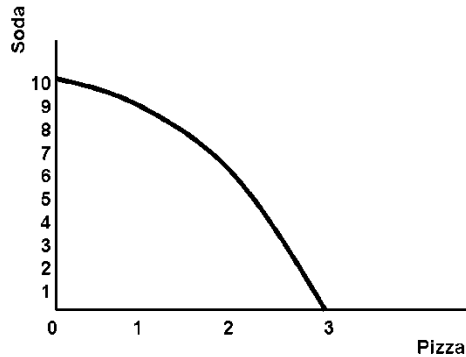
Counterfactual: An educated guess as to what would have happened had a policy or an event not occurred.

Teaching Tips

- 1) *Use an example of a controversial policy and have students imagine what would have happened had the policy not been enacted. Examples from the past: TARP, the Obama Stimulus package, the COVID-19 stay-at-home orders.*
- 2) ***Let students discuss** to see if they can generate examples of their own.*

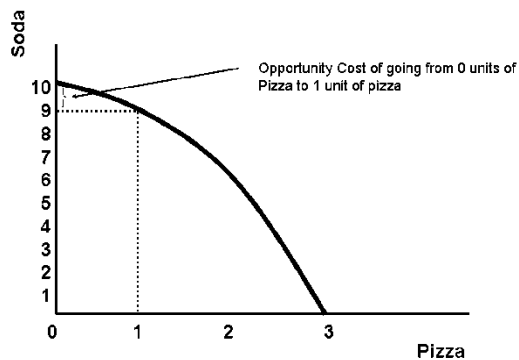
KICK IT UP A NOTCH: DEMONSTRATING CONSTANT AND INCREASING OPPORTUNITY COST

Demonstrating Increasing Opportunity Cost



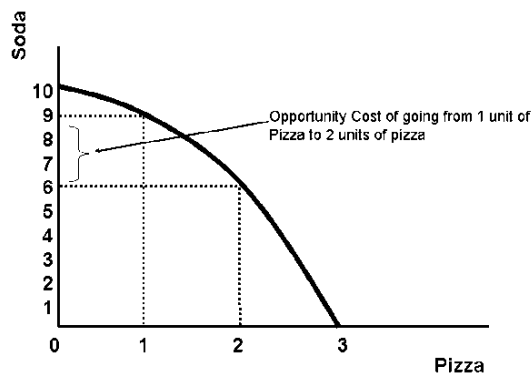
Drawing Tip

Draw a bowed-out production possibility frontier, and label the horizontal axis evenly across in thirds.



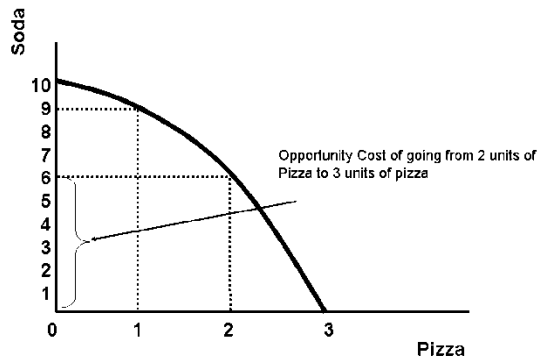
Drawing Tips

- 1) Mark up from 1 unit of pizza to the curve and over to the vertical axis.
- 2) Mark the distance from the point where only soda is produced to the dotted line just drawn as the opportunity cost of going from 0 units of pizza to 1 unit.



Drawing Tips

- 1) Mark up from 2 units of pizza to the curve and over to the vertical axis.
- 2) Mark the distance from the previous dotted line to the dotted line just drawn as the opportunity cost of going from 1 unit of pizza to 2 units.



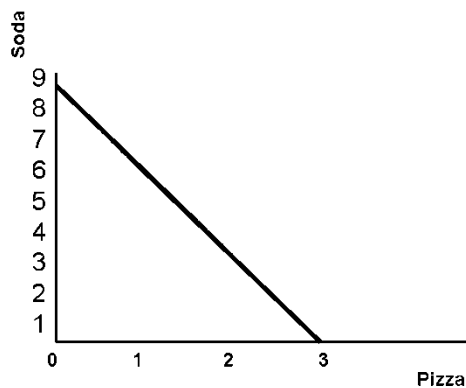
Drawing Tips

- 1) Mark up from 3 units of pizza to the curve and over to the vertical axis.
- 2) Mark the distance from the previous dotted line to the dotted line just drawn as the opportunity cost of going from 2 units of pizza to 3 units.

Teaching Tips

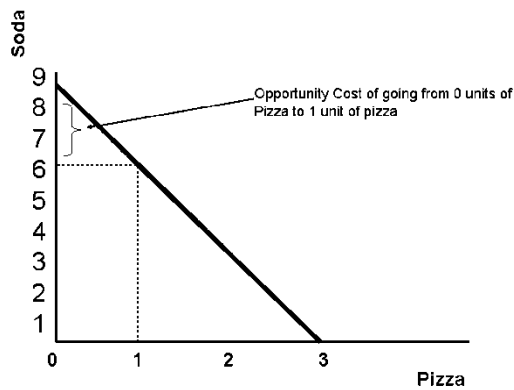
- 1) Use the example of the tradeoff between a good GPA and the fun you can have in college. Draw a PPF with these as the goods. Use the maximum GPA point to talk about the best they could do if they studied all the time (it may not be a 4.0). Note that people may have different PPFs depending on how “smart” they are.
- 2) **Let students discuss** the optimal study time-fun time strategy for themselves. Steer them toward the idea that not much “fun” happens while class is going on and that if they confine their fun to Friday and Saturday night they could have a great deal of fun and have a good GPA.

Demonstrating Constant Opportunity Cost



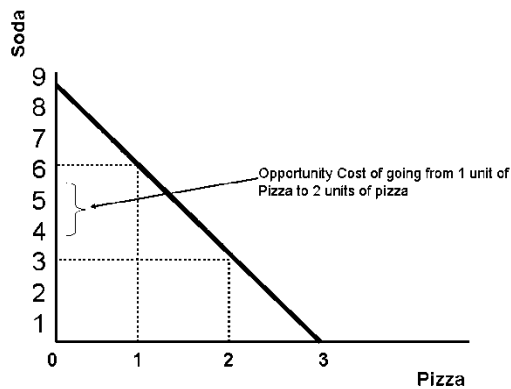
Drawing Tip

Draw a linear production possibility frontier and label the horizontal axis evenly across in thirds.



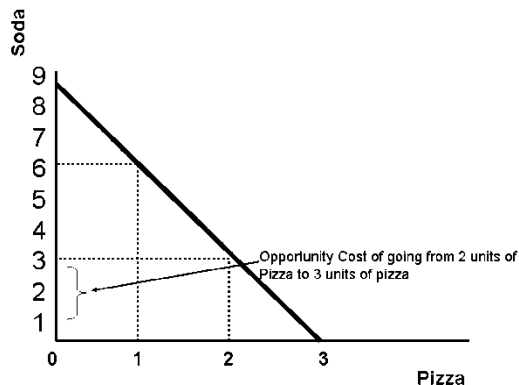
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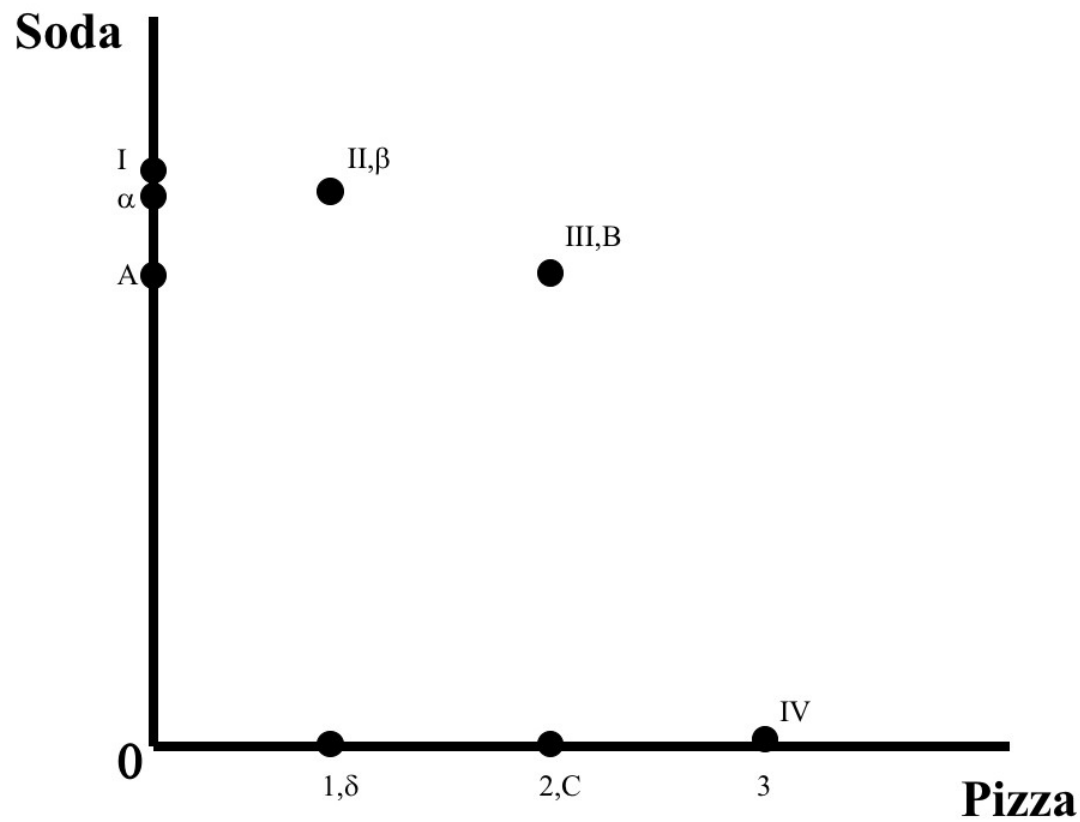


Drawing Tips

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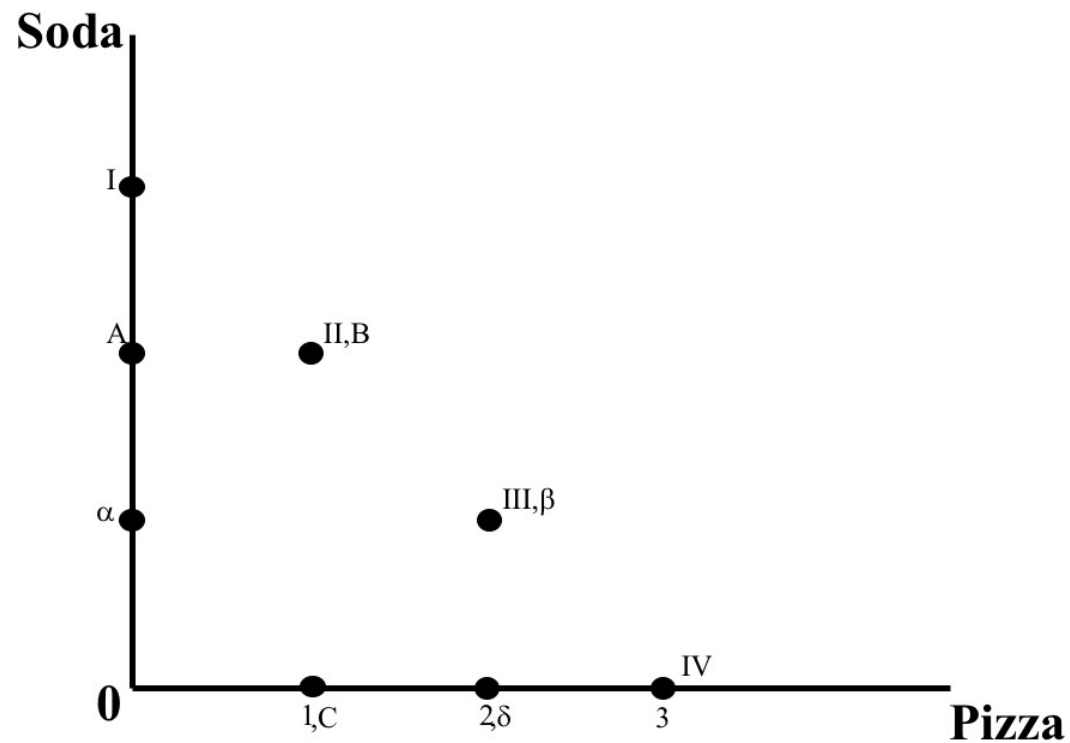
Dot-to-Dot

The two graphs below are old-fashioned dot-to-dots. I used them for the first time in the Fall 2003 semester and they were amazingly effective in getting students comfortable with drawing the graphs. They should be used after explaining the concepts and after you have talked about some of the mechanics. They seemed to help students become more comfortable with the steps of drawing a graph.



Connect I-IV with one continuous arc to get the PPF; Connect α , β , δ with a straight line; Connect A,B,C with a straight line.

The gap between I- α represents OC of 1 unit of pizza; The gap between α -A represents OC of going from 1 unit to 2 units of pizza; The gap between A-origin represents the OC of going from 2 to 3 units of pizza.



Connect I-IV to get the PPF; Connect A,B,C; Connect α,β,δ ;

The gap between I-A represents the OC of 1 unit of pizza; The gap between A- α represents the OC of going from 1 to 2 units of pizza; The gap between α and the origin represents the OC of going from 2 to 3 units of pizza.