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CHAPTER 2 COMPARATIVE ADVANTAGE

Answers to Review Questions

1. An individual has a comparative advantage in the production of a particular good if she can produce it at a lower opportunity cost than other individuals. An individual has an absolute advantage in the production of a good if she can produce more of that good than another individual, using comparable amounts of time, raw materials and effort.

Learning Objective: 02-01
AACSB: Reflective Thinking
Bloom's: Remember

2. The fact that English has become the *de facto* international language has done much to stimulate international demand for American-made books, movies and popular music. The large size of the American market has given the United States an additional advantage over other English-speaking countries, like England, Canada, and Australia.

Learning Objective: 02-01
AACSB: Reflective Thinking
Bloom's: Remember

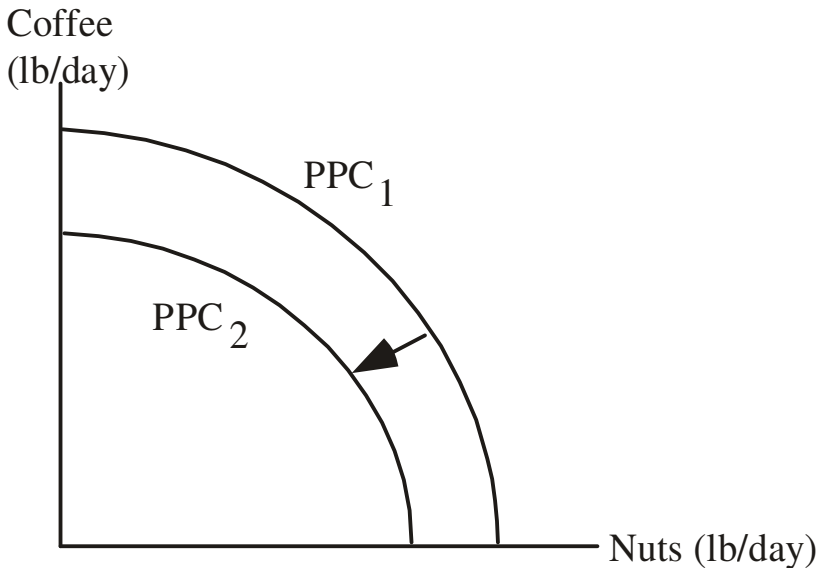
3. According to the Principle of Comparative Advantage, people will perform their own services when the opportunity cost of doing so is low. This implies that performing services yourself is not a matter of whether you are rich or poor but rather the opportunity cost of your time. Furthermore, limited specialization will mean less overall production for a nation, which is usually interpreted as poverty.

Learning Objective: 02-02, 02-03
AACSB: Analytical Thinking
Bloom's: Analyze

4. A reduction in the number of hours worked each day will shift all points on the production possibilities curve inward, toward the origin, as this reduces the maximum amount that can be produced of either good. The graph below illustrates this situation.

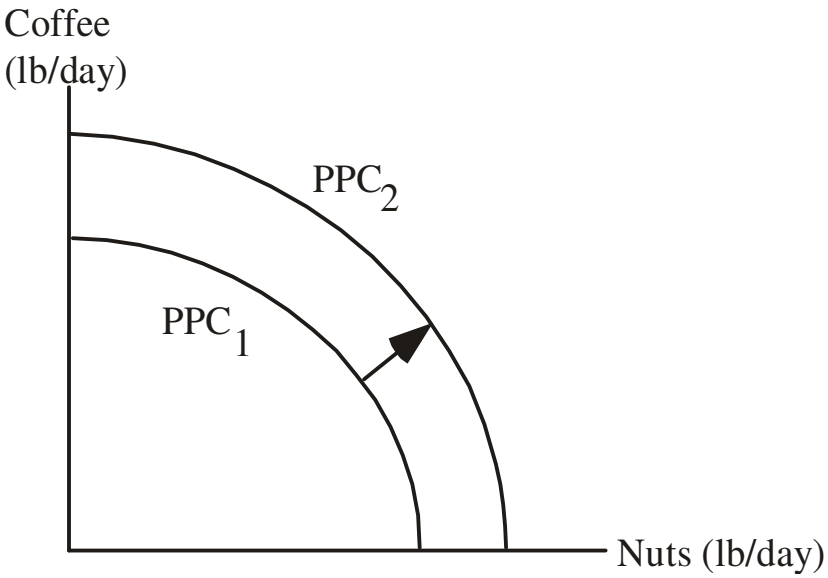
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Learning Objective: 02-03
AACSB: Reflective Thinking
Bloom's: Understand

5. Technological innovations that boost labor productivity will shift all points on the production possibilities curve outward, away from the origin. The graph below illustrates this situation.



Learning Objective: 02-03
AACSB: Reflective Thinking
Bloom's: Understand

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Answers to Problems

1. In the time it takes Ted to wash a car he can wax 3 cars (60 minutes/20 minutes per wax job). Therefore, Ted's opportunity cost of washing one car is 3 wax jobs. In the time it takes Tom to wash one car, 30 minutes, he can wax 2 cars (30 minutes/15 minutes per wax job). Therefore, Tom's opportunity cost of washing one car is 2 wax jobs.

   Alternatively, you can compute how many cars each person can wash or wax in a certain time period, such as an hour, and then use these quantities to compute their respective opportunity costs. In 60 minutes, Ted can wax 3 cars or wash 1 car, so his opportunity cost of washing one car is 3 (= 3/1) wax jobs. Likewise, in 60 minutes, Tom can wax 4 cars or wash 2 cars, so his opportunity cost of washing one car is 2 (or 4/2) wax jobs.

   Because Tom's opportunity cost of washing a car is lower than Ted's, Tom has a comparative advantage in washing cars.

Learning Objective: 02-01
AACSB: Knowledge Application
Bloom's: Apply

2. If Ted washes 12 cars, then he gives up on waxing 4 cars. So for every car he washes, he gives up on waxing 4/12 = 0.33 cars, implying that Ted's opportunity cost of washing one car is 0.33 wax jobs. If Tom washes 6 cars, he gives up on waxing 3 cars. So for every car he washes, he gives up on waxing 3/6 = 0.50 cars, implying that Tom's opportunity cost of washing one car is 0.50 wax jobs.

   Because Ted's opportunity cost of washing a car is lower than Tom's (0.33 < 0.50), Ted has a comparative advantage in washing cars.

Learning Objective: 02-01
AACSB: Knowledge Application
Bloom's: Apply

3. In the time it takes Nancy to replace a set of brakes, 2 hours, she can complete one-half of a clutch replacement (2 hours for brakes/4 hours for a clutch). Therefore, Nancy's opportunity cost of replacing a set of brakes is one-half of a clutch replacement. In the time it takes Bill to replace a set of brakes, 2 hours, he can complete one-third of a clutch replacement (2 hours for brakes/6 hours for a clutch). Therefore, Bill's opportunity cost of replacing a set of brakes is one-third of a clutch replacement.

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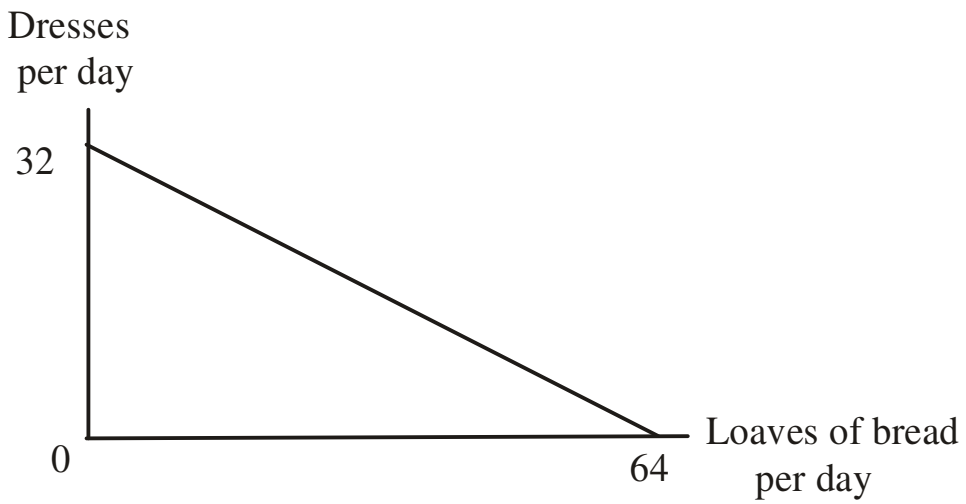
Alternatively, you can compute how many clutches or brakes each person can replace in a certain time period, such as 6 hours, and then use these quantities to compute their opportunity cost. In 6 hours, Nancy can replace 1.5 clutches or 3 sets of brakes, so her opportunity cost of replacing one set of brakes is one-half of a clutch replacement (1.5/3). Likewise, in 6 hours, Bill can replace 1 clutch or 3 sets of brakes, so his opportunity cost of replacing one set of brakes is one-third of a clutch replacement (1/3).

Bill's opportunity cost of replacing a set of brakes is lower than Nancy's, so Bill has a comparative advantage in replacing brakes. This also implies that Nancy has a comparative advantage in replacing clutches (the opportunity cost of replacing a clutch is the inverse of the opportunity cost of replacing a set of brakes).

Finally, neither person has an absolute advantage in brake replacement since it takes Nancy and Bill the same amount of time to replace a set of brakes. Nancy has an absolute advantage over Bill in clutch replacement since it takes her less time than it takes Bill to perform that job.

Learning Objective: 02-01
AACSB: Knowledge Application
Bloom's: Apply

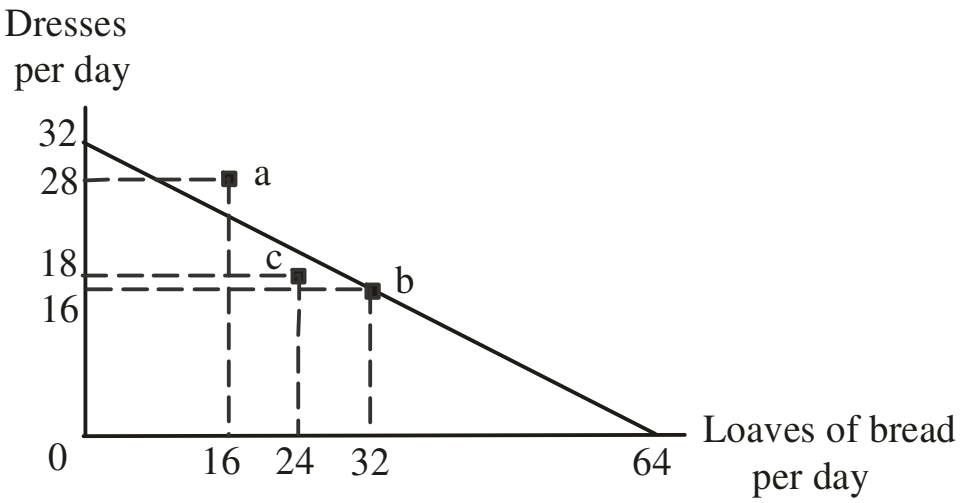
4. a. Helen's production possibilities curve would look like the following:



b. As the graph shows, 28 dresses per day and 16 loaves of bread per day is outside the production possibilities curve (PPC) and is therefore an unattainable combination for Helen. The combination of 16 dresses per day and 32 loaves of bread per day is both attainable and efficient. Finally, 18 dresses per day and 24 loaves of bread per day is a combination that lies beneath the PPC, which is attainable but inefficient. Here, Helen could either complete more dresses or more loaves of bread per day.

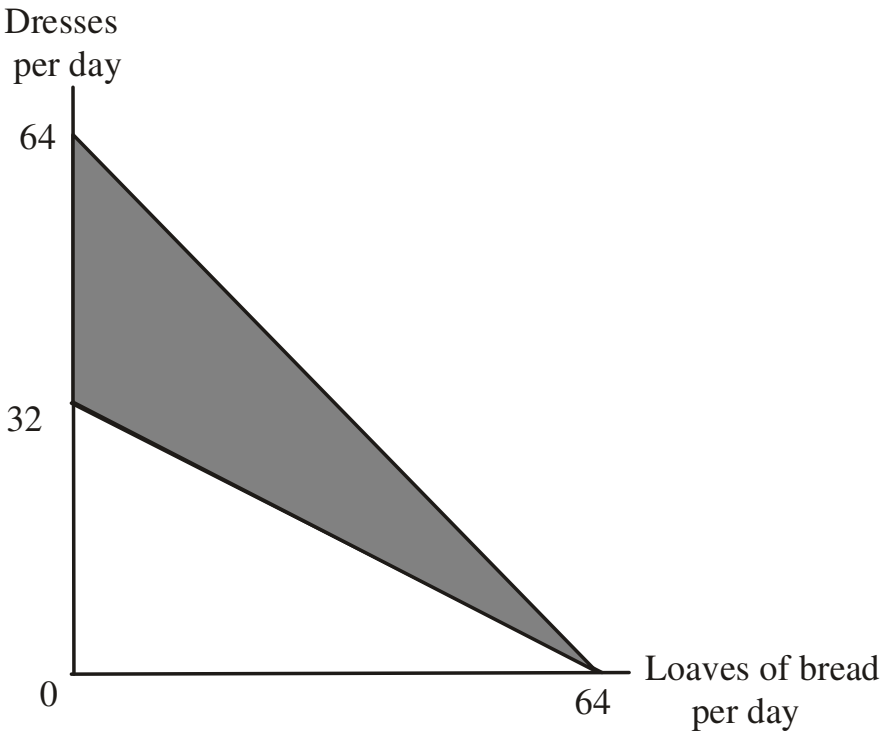
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Learning Objective: 02-02
AACSB: Knowledge Application
Bloom's: Apply

5. a. As shown below, the new machine doubles the value of the vertical intercept of Helen's PPC.



b. Since Helen can sew twice as many dresses per hour as before, she can now sew any given number of dresses in half as much time as before. With the time saved, she can bake additional loaves of bread.

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c. The upward rotation of Helen's PPC means that she is now able for the first time to produce at any of the points in the shaded region of the graph above. Note that her menu of opportunity increased with respect to dresses *and* with respect to bread as well. For example, she can now produce 32 dresses and 32 loaves of bread instead of 32 dresses and no loaves.

Learning Objective: 02-03
AACSB: Knowledge Application
Bloom's: Apply

6. a. Their maximum possible coffee output is 36 pounds per day (12 from Tom and 24 from Susan). Their maximum possible output of nuts is also 36 pounds per day (12 from Susan and 24 from Tom).

b. Susan should be sent to pick coffee, since her opportunity cost (half a pound of nuts per pound of coffee) is lower than Tom's (2 pounds of nuts per pound of coffee). It will take Susan 2 hours to pick 8 pounds of coffee, which means that she can still gather 8 pounds of nuts. So they will have a total of 32 pounds per day of nuts.

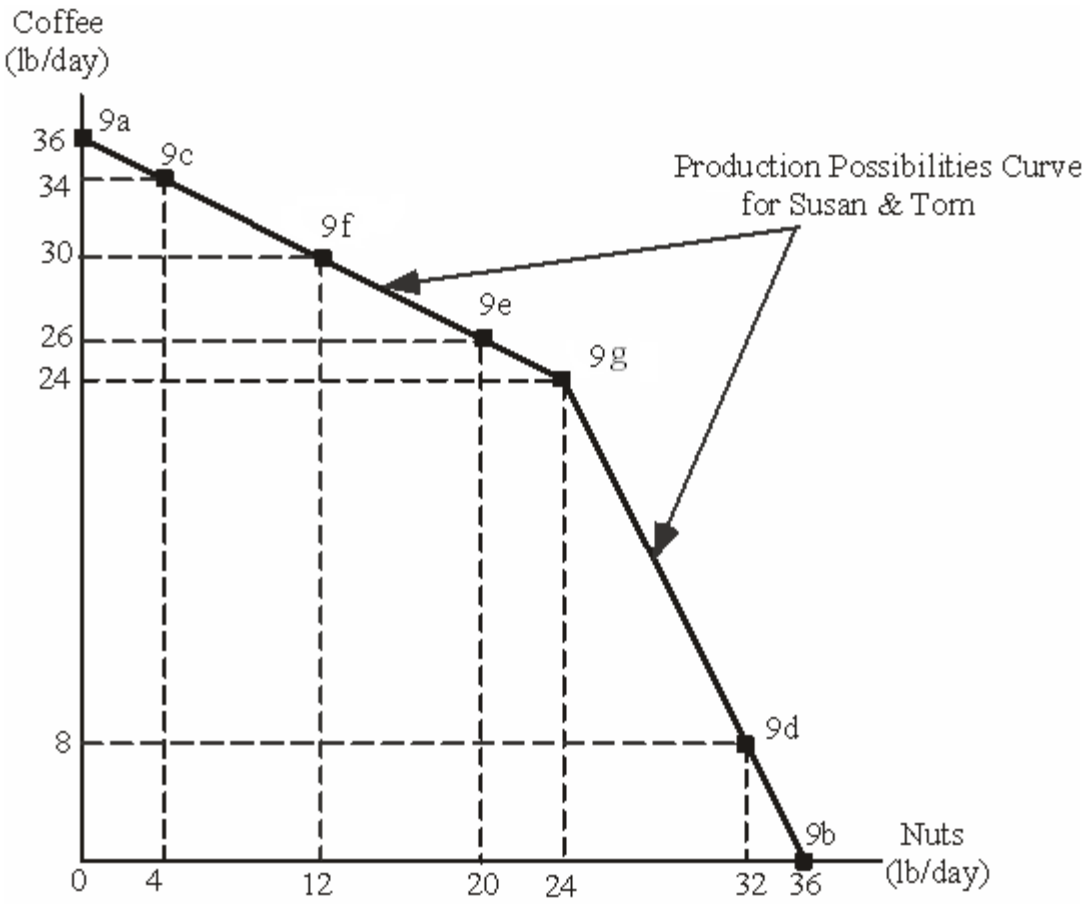
c. To gather 26 pounds of nuts per day, Tom should work full time gathering nuts (24 pounds per day) and Susan should spend one hour per day gathering nuts (2 pounds per day). Susan would still have 5 hours available to devote to picking coffee, so she can pick 20 pounds of coffee per day.

d. The point 30 pounds of coffee per day and 12 pounds of nuts per day can be produced by having Susan work full time picking coffee (24 pounds of coffee per day) while Tom spends 3 hours picking coffee (6 pounds of coffee) and 3 hours gathering nuts (12 pounds of nuts).

e. The points and the straight lines connecting them are shown in the graph below. The production possibilities curve for the two-person economy consisting of Susan and Tom shows the maximum possible amount of coffee production on the vertical axis for any given quantity of daily nut production on the horizontal axis.

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Learning Objective: 02-03
AACSB: Knowledge Application
Bloom's: Apply

7. a. By specializing completely, they can produce 24 pounds of coffee per day and 24 pounds of nuts (the point at which the kink occurs in the PPC in the diagram). If they sell this output in the world market at the stated prices, they will receive a total of $96 per day.

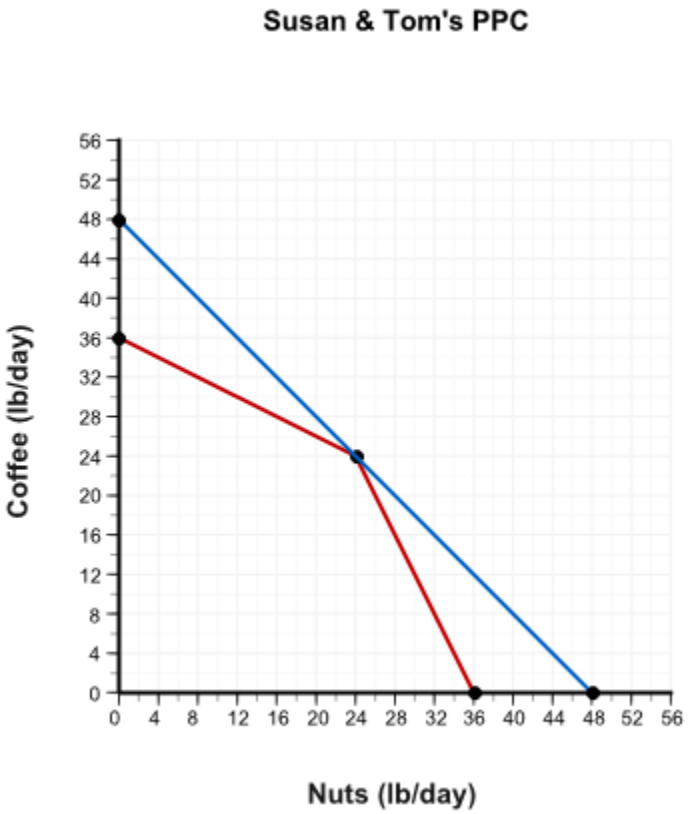
b. With $96 per day to spend, the maximum amount of coffee they could buy is 48 pounds per day, or they could buy 48 pounds of nuts per day.

The combination of 40 pounds of coffee and 8 pounds of nuts would be unattainable for Susan and Tom if they were not able to buy and sell in the world market, as the maximum amount of coffee that can be picked is 36 pounds per day. However, if they buy and sell in the world market, 40 pounds of coffee would cost $80, and 8 pounds of coffee would cost $16, so they would have just enough money ($96 per day) to buy this combination of goods.

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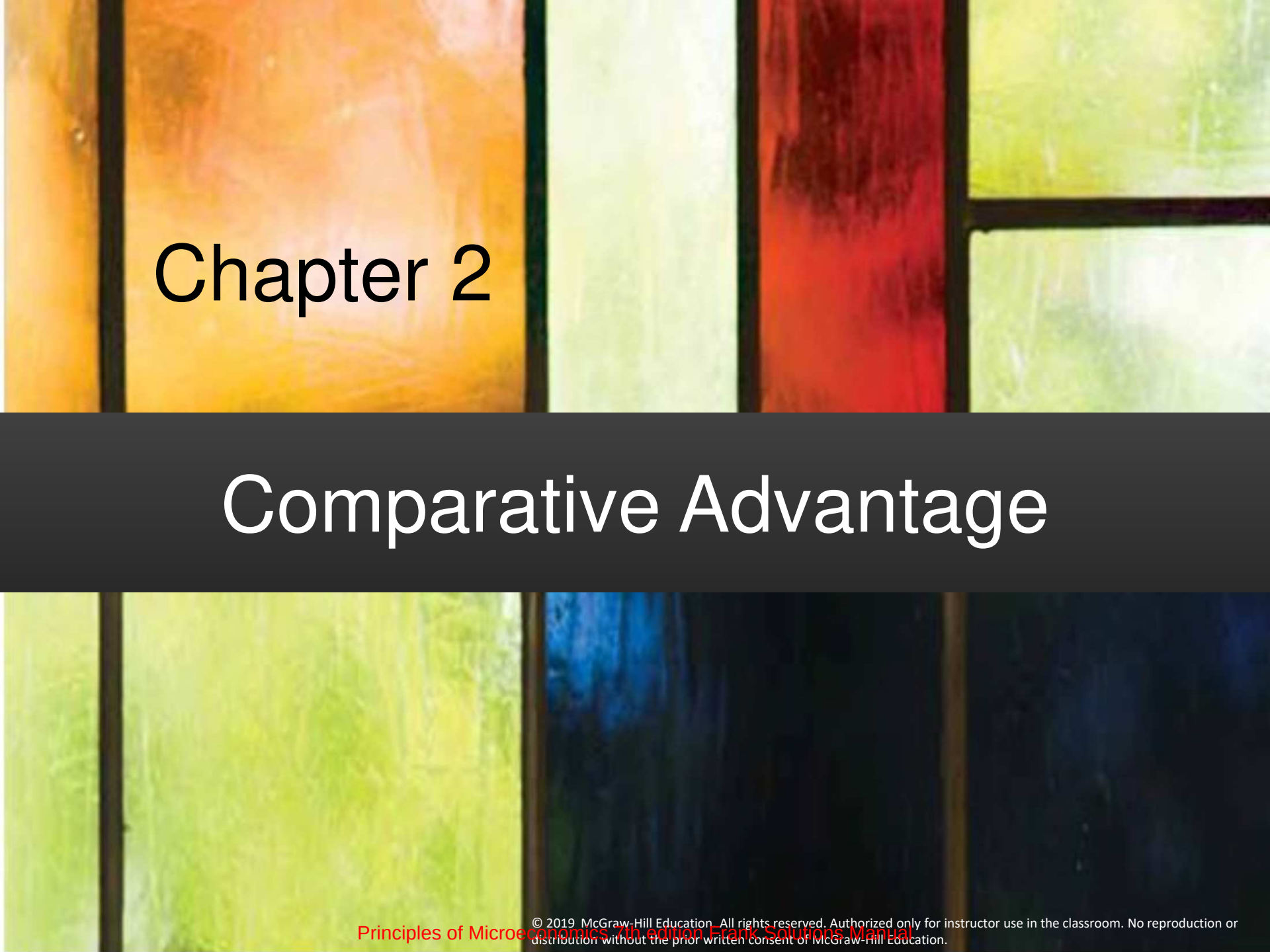
c. The points and the straight lines connecting them are shown in the diagram below. The resulting line is the production possibilities curve for the two-person economy consisting of Susan and Tom.



Learning Objective: 02-02, 02-03
AACSB: Knowledge Application
Bloom's: Apply

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Chapter 2

Comparative Advantage

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Learning Objectives

1. Explain and apply the ***Principle of Comparative Advantage.***
2. Explain and apply the *Principle of Increasing Opportunity Cost* (also called the ***Low-Hanging-Fruit Principle***).
3. Identify factors that shift the menu of production possibilities.
4. Explain and apply the role of comparative advantage in international trade and describe why some jobs are more vulnerable to outsourcing than others.

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Exchange and Opportunity Cost

- Joe Jamail, a highly successful trial attorney, employs another attorney to write his will
  - Writing your own will: ***2 hours***
  - Opportunity cost of 2 hours: ***$10,000+***
  - Hiring someone to spend 4 hours on your will: ***$800***
- Do It Yourself only when

Opportunity cost < hired cost

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Exchange and Opportunity Cost

- A person has an ***absolute advantage*** at a particular task if he or she can perform the task in fewer hours than the other person
- A person has a ***comparative advantage*** at a particular task if his or her ***opportunity cost*** of performing the task is lower than the other person's opportunity cost
- Comparative advantage doesn't just care about your skill at a task, but about your skill at that task ***compared*** to your skill at other tasks

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The Principle of Comparative Advantage

The Principle of Comparative Advantage

Everyone does best when each person (or each country) concentrates on the activities for which his or her opportunity cost is the lowest.

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The Principle of Comparative Advantage

- Multiple people are faced with multiple tasks. How should they assign the work?
  - Each should concentrate on the activities for which they have the lowest opportunity cost

Total value of output increases with ***specialization and trade***

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Comparative Advantage Example

Production Times	Web Update	Bike Repair
Mary	20 minutes	10 minutes
Paula	30 minutes	30 minutes

- Paula and Mary can each update web pages and repair bikes
    - Mary has an absolute advantage in both
  - Comparative advantage drives specialization
  - So who has a comparative advantage in what?

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Comparative Advantage Example

Production Times	Web Update	Bike Repair
Mary	20 minutes	10 minutes
Paula	30 minutes	30 minutes

Opportunity Cost	Web Update	Bike Repair
Mary	2 repairs	0.5 update
Paula	1 repair	1 update

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Comparative Advantage Example

Production Times	Web Update	Bike Repair
Mary	20 minutes	10 minutes
Paula	30 minutes	30 minutes

Hourly Output	Web Update	Bike Repair
Mary	3 updates	6 repairs
Paula	2 updates	2 repairs

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Comparative Advantage Example

Hourly Output	Web Update	Bike Repair
Mary	3 updates	6 repairs
Paula	2 updates	2 repairs

- 16 web updates are ordered
  - Mary spends half her time at each activity: 12 updates and 24 repairs
  - Paula produces 4 updates and 12 repairs
  - Total output 16 updates and 36 repairs
- Specialization produces 16 updates and 48 repairs
  - 12 more repairs for the same inputs!

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Another Example

Hourly Output	Web Update	Bike Repair
Pat	2 updates	1 repair
Meg	3 updates	3 repairs

- This table shows output per hour
  - Apply the Principle of Comparative Advantage
    - Look at opportunity cost per unit
    - Pat repairs bikes and Meg updates web pages

Opportunity Cost	Web Update	Bike Repair
Pat	½ repair	2 updates
Meg	1 repair	1 update

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Where Have All the 0.400 Hitters Gone

- None since 1941
  - Not a decline in athletic ability
- Specialization keeps averages lower
  - Pitching and fielding skills have improved
    - Pitchers specialize in starters, middle relievers, and closers; right- or left-handed batters; strikeouts
    - Fielders play one position
    - Specialized coaches
    - Detailed analysis of hitters' weaknesses

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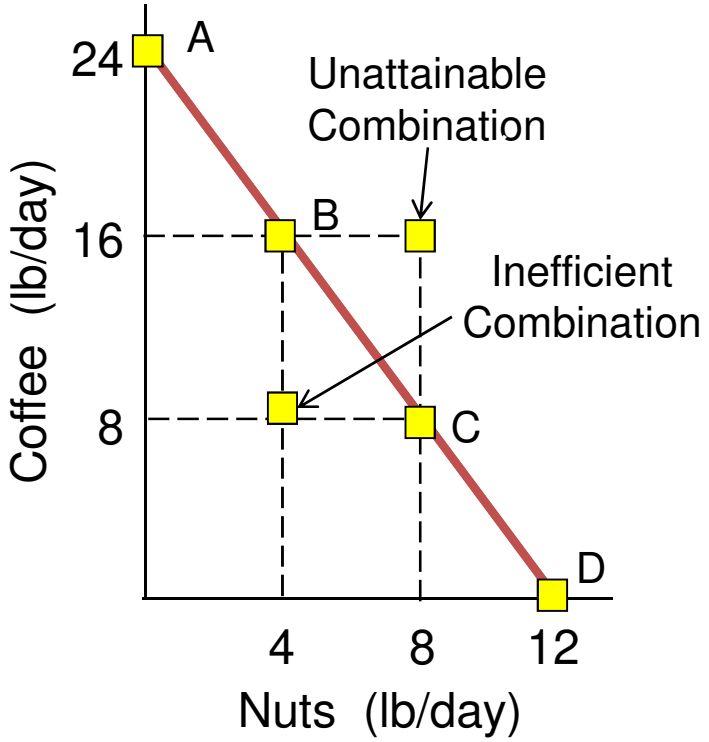
Sources of Comparative Advantage

- **Talent**
- **Natural resources**
- **Cultures or societal norms**
  - Languages
  - Institutions
    - Value placed on craftsmanship
    - Support for entrepreneurship

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Production Possibilities Curve

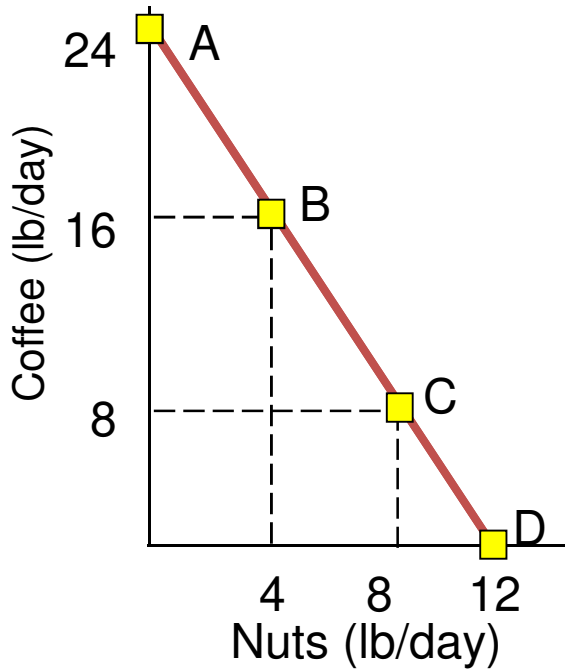
- A **production possibilities curve** illustrates the combinations of two goods that can be produced with given resources
- Definitions:
  - **Unattainable point**
  - **Attainable point**
    - **Inefficient point**
    - **Efficient point**
- *Scarcity Principle*
  - Give up one good to get another



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Susan's Production Possibilities

- Two goods: coffee and nuts
  - Work 6 hours per day
- 1 hour of labor
    = 4 pounds of coffee OR
    = 2 pounds of nuts
  - Graph shows options
    - Negative slope



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Susan's Opportunity Costs

- Marginal cost: – 8 coffee
- Marginal benefit: 4 nuts

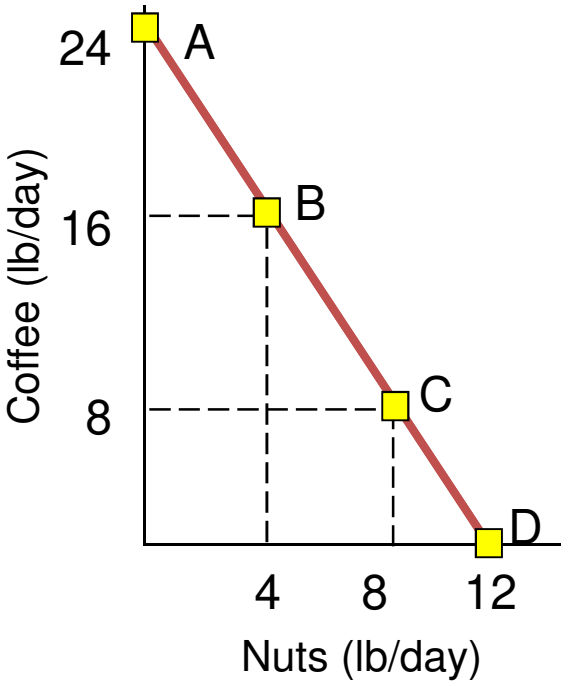
$$\frac{\text{Loss in coffee}}{\text{Gain in nuts}}$$

Opportunity cost of 1 nut is 2 coffee

- Marginal cost: – 8 nut
- Marginal benefit: 16 coffee

$$\frac{\text{Loss in nuts}}{\text{Gain in coffee}}$$

Opportunity cost of 1 coffee is ½ nut



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Tom's Production Possibilities

Work 6 hours per day

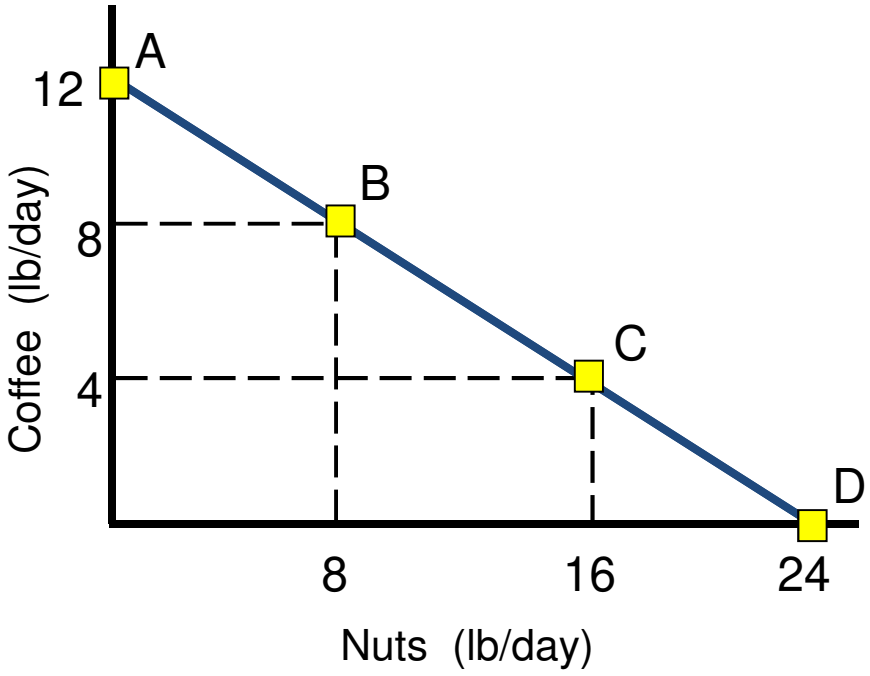
- Productivity determines the slope of the PPC

– 1 hour of labor
  = 4 pounds of nuts OR
  = 2 pounds of coffee

- Opportunity cost

– Marginal cost: – 4 coffee
– Marginal benefit: 8 nuts

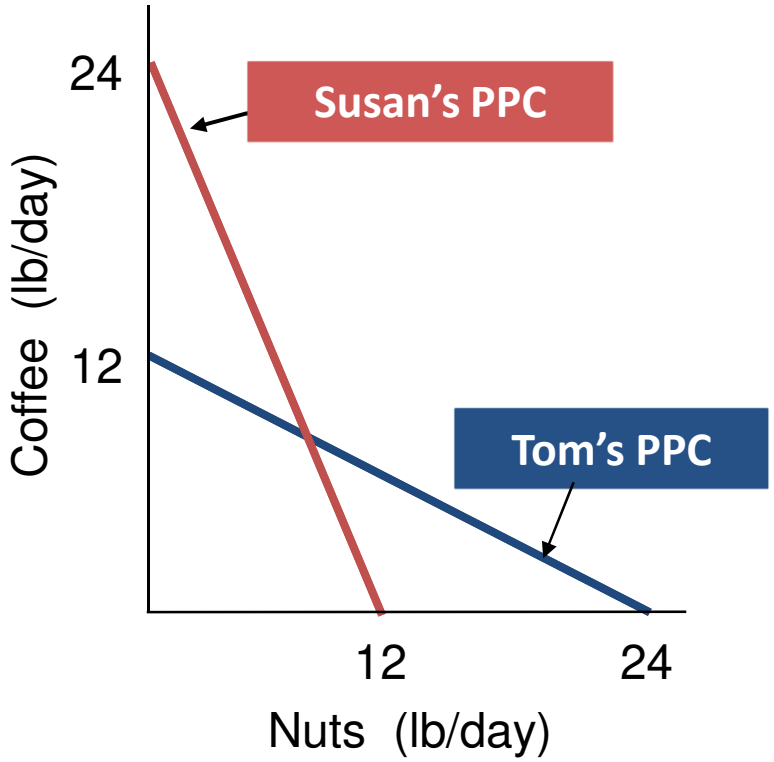
- Tom's opportunity cost of 1 coffee is 2 nuts
- His opportunity cost of 1 nut is ½ coffee



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Tom, Meet Susan

- PPCs show comparative advantage
  - Sue's curve is steeper, better for coffee
  - Tom's curve is flatter, better for nuts
- Comparative advantage is a comparison
- To get 1 coffee
  - Sue gives up ½ nuts
  - Tom gives up 2 nuts



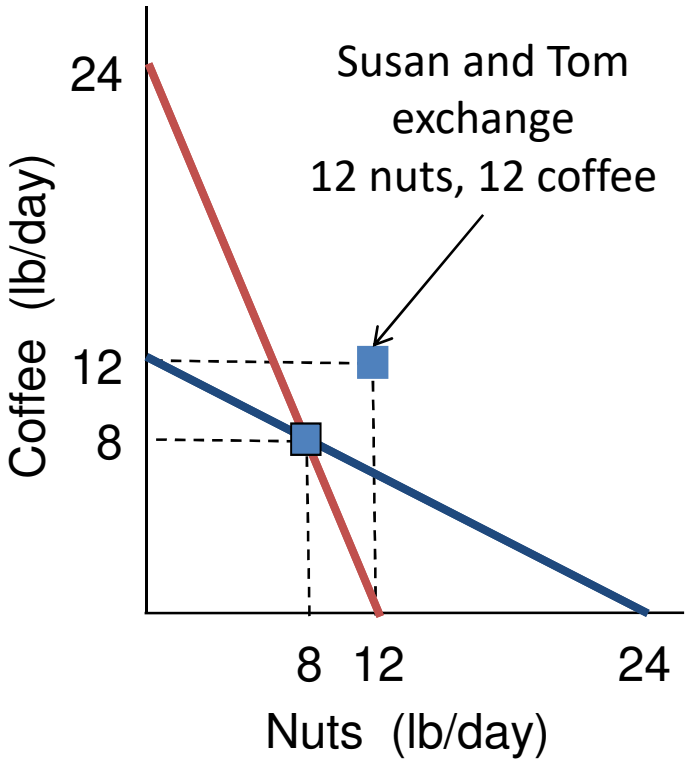
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Gains from Specialization and Trade

- Without trade, each person can consume along his production possibilities curve
  - What you produce determines what you consume
- With trade, each person's consumption can be greater than production
  - Produce according to comparative advantage
  - Trade to get what you want

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Gains from Specialization and Trade

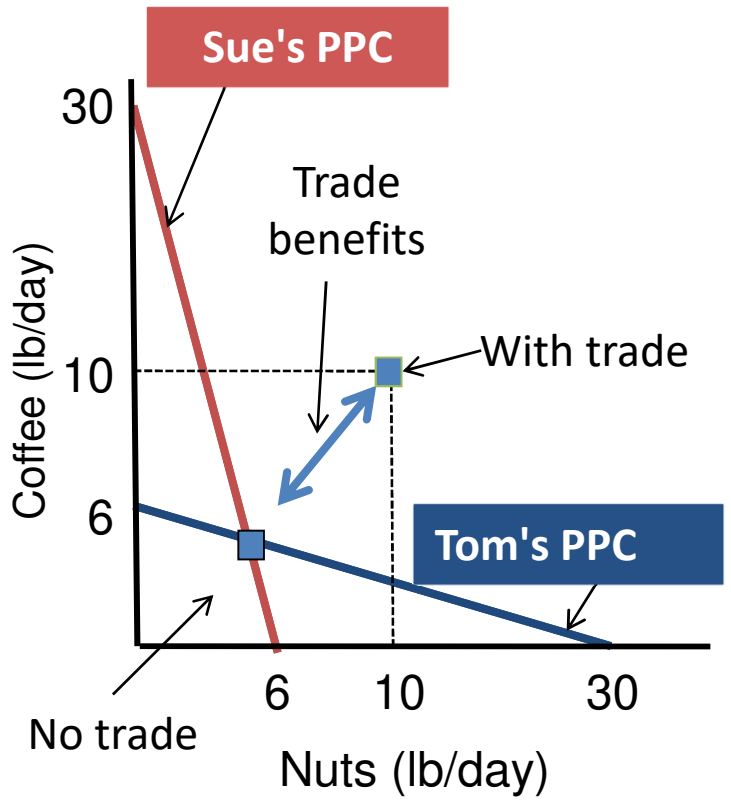


- Preferred diet is half nuts, half coffee
  - No trade: 8 pounds of coffee and 8 pounds of nuts

    Total output is 32 pounds
- Specialization gives each person 12 pounds of each good
  - 48 total pounds

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Gains from Specialization and Trade

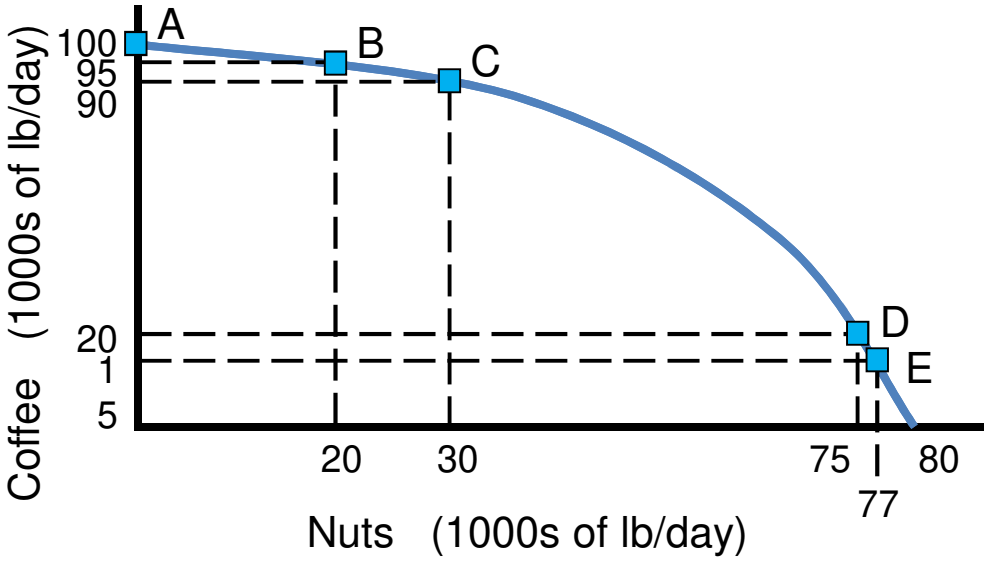


- Benefits increase when differences in opportunity cost increase
  - Sue's opportunity cost of one pound of nuts increases to 5 coffee
  - Tom's opportunity cost of one pound of coffee increases to 5 nuts
- No trade: 5 nuts and 5 coffee each
- With trade: 10 nuts and 10 coffee each

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Production Possibilities for an Economy

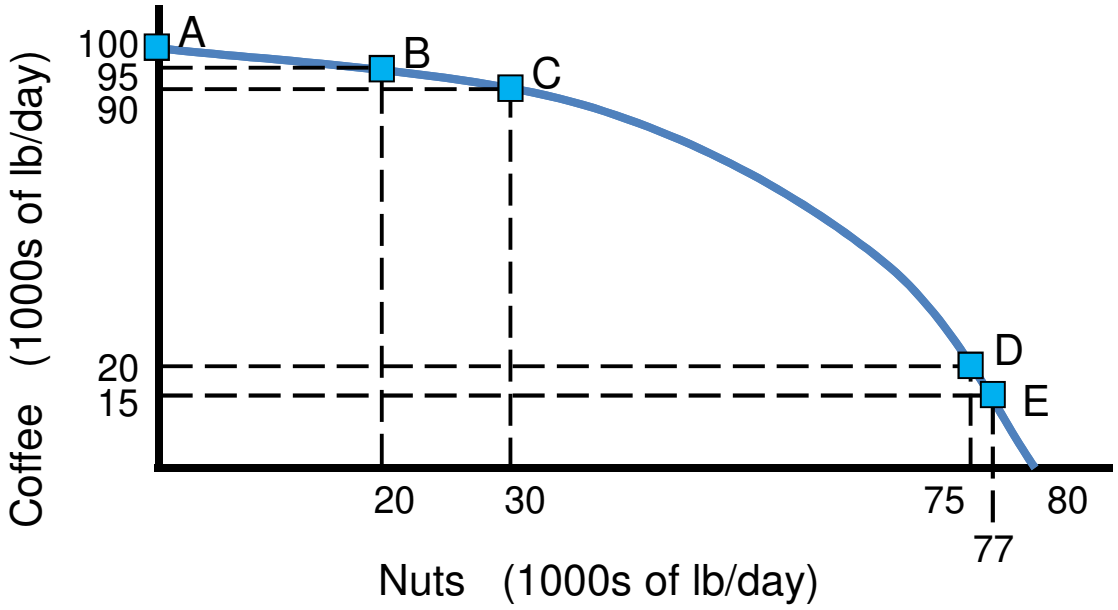
- Two goods: coffee and nuts
- Multiple people
  - Different opportunity costs
- Intercepts show maximum production of one good
- Some resources better at coffee, some better at nuts



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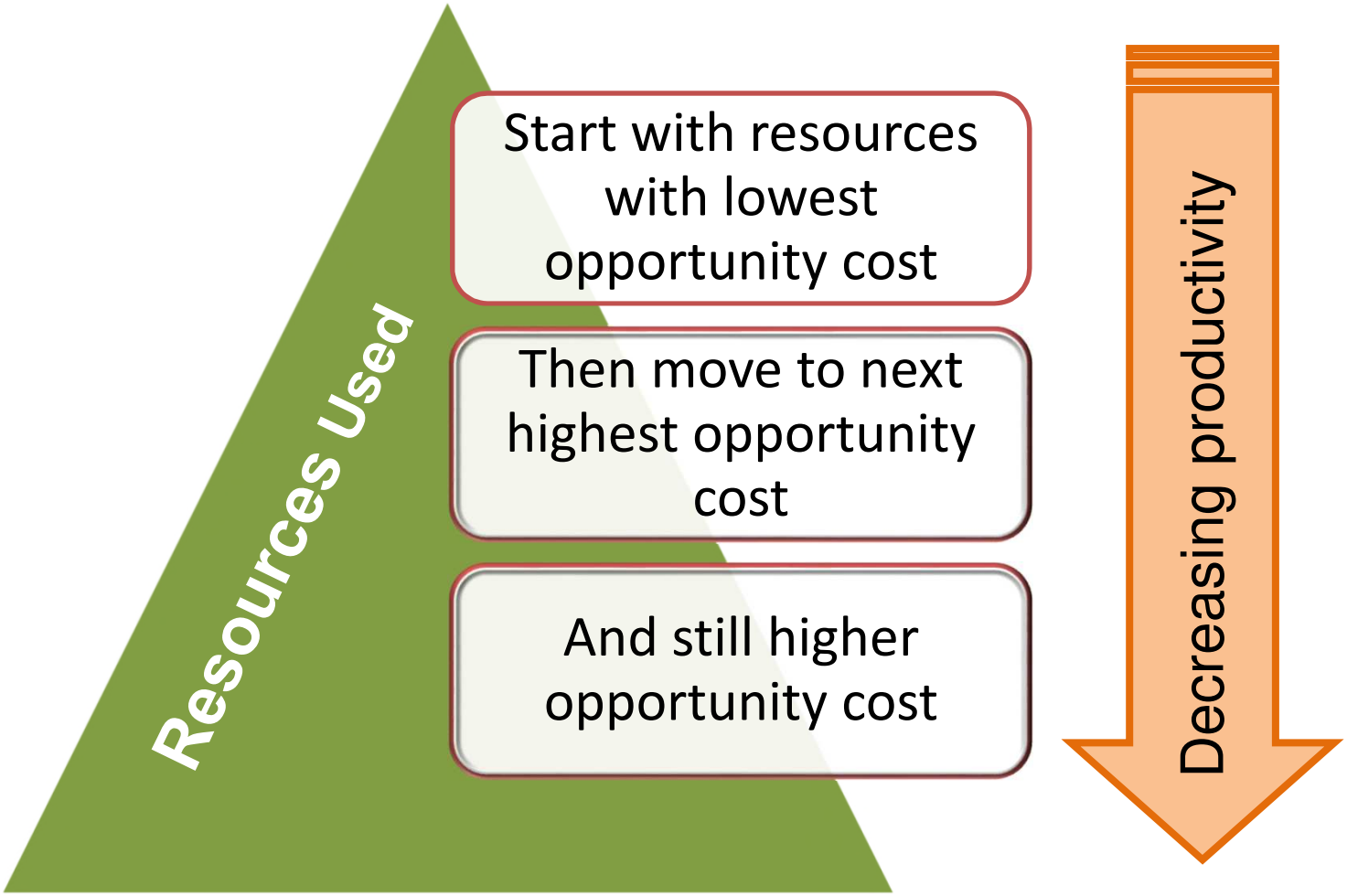
The Principle of Increasing Opportunity Cost

- Maximum coffee: 100,000 lb. / day
  - Give up 5,000 pounds coffee, get 20,000 pounds of nuts
  - Give up another 5,000 pounds of coffee, get 10,000 additional pounds of nuts



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The Principle of Increasing Opportunity Cost



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The Dynamic Economy

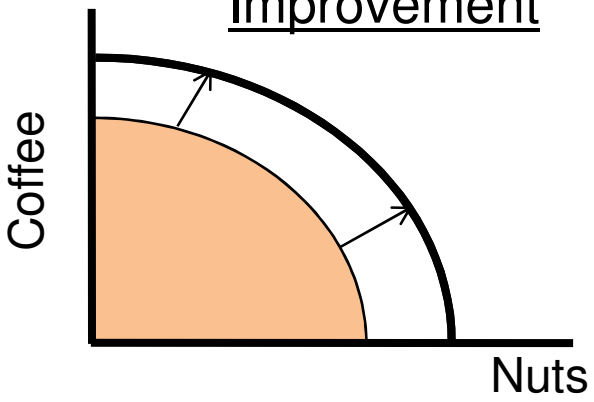
- A PPC represents current choices
  - Changes in choices occur over time due to
    - More resources
      - Investment in capital
      - Population growth
    - Improvements in technology
      - More specialization: start-up and switching costs
    - Increases in knowledge

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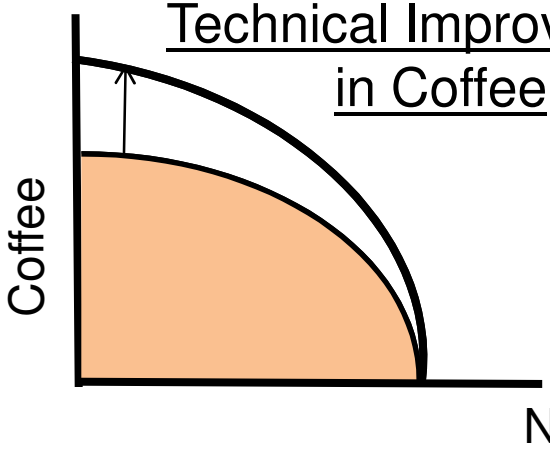
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Shifts in PPC

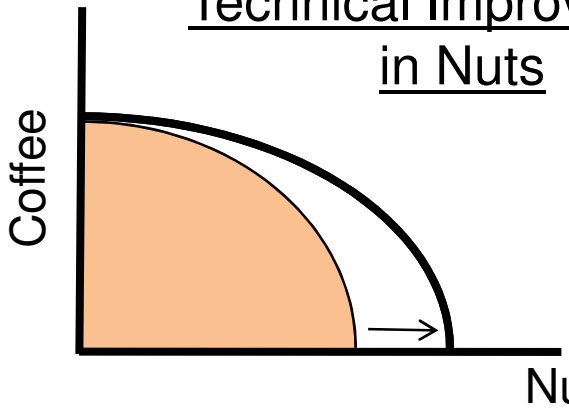
Neutral Technical Improvement



Technical Improvement in Coffee



Technical Improvement in Nuts



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Some Countries Resist Specialization

- Specialization is easier when
  - Population density passes a threshold
  - Markets are connected
    - Transportation for goods
    - Communications for services
  - Legal framework supports business
  - Financial markets enable start-ups

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Too Much Specialization

- Imagine this:
  - Your hair stylist only cuts blonde hair
  - An expert in tropical diseases opens a practice in a town of 500 people in Wisconsin
  - Seven bookstores, each open a different day of the week

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Comparative Advantage and International Trade

- Principle of Comparative Advantage and gains from trade apply worldwide
  - Potentially large gains from trading with different and distant countries
- Trade can be controversial
  - Trade benefits society broadly
  - Costs are concentrated
    - Some industries suffer
    - People lose their jobs

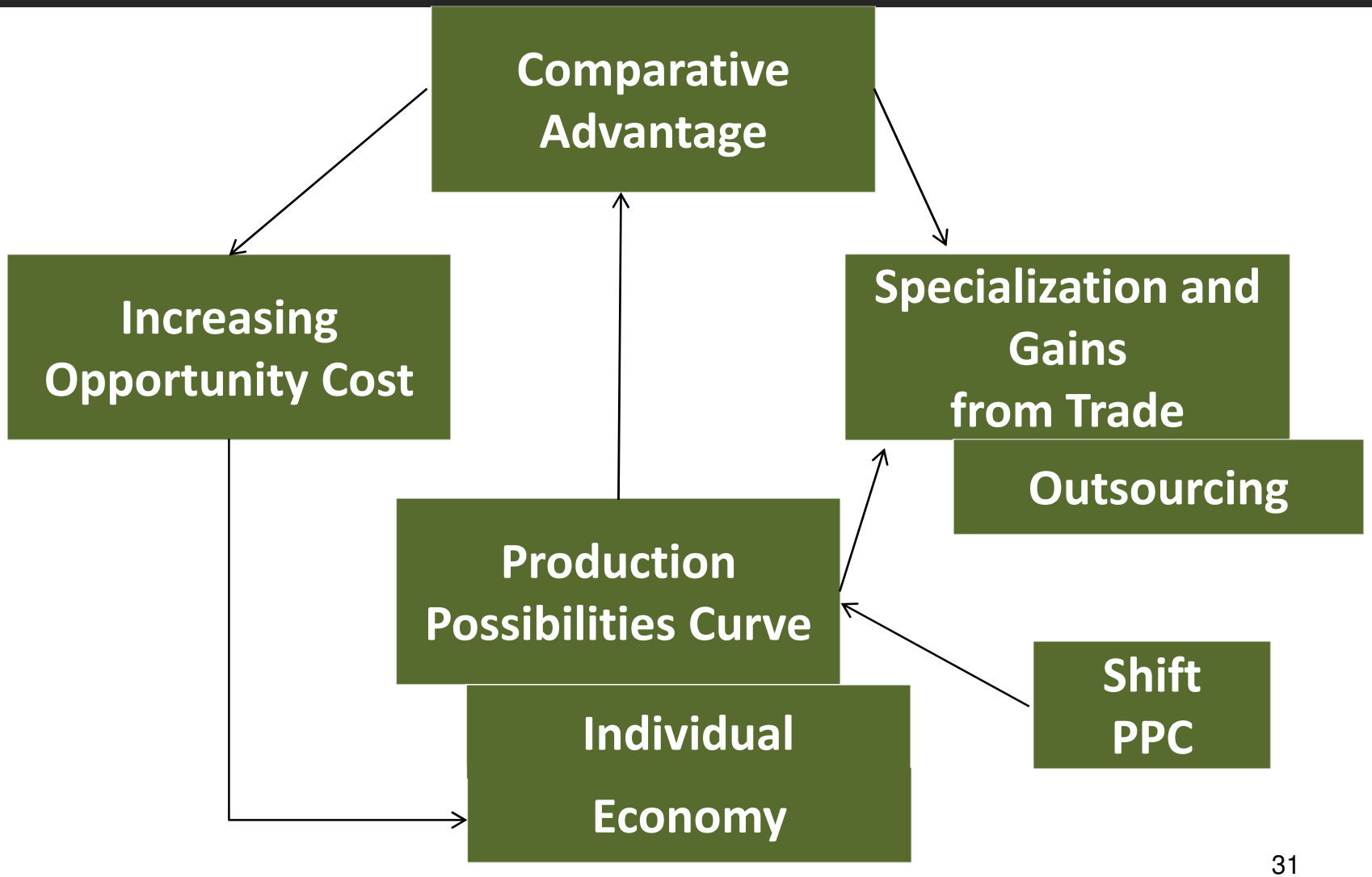
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Outsourcing

- Service work performed overseas by low wage workers has been termed ***outsourcing***
  - Medical transcription
  - Customer call centers
  - Medical tourism
  - Technical writing
- Limits to outsourcing
  - Quality control
  - Physical presence (haircuts)
  - Complex communications
  - Understand nuance
- Greatest security for workers is the ability to adapt quickly to changing circumstances

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Comparative Advantage



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