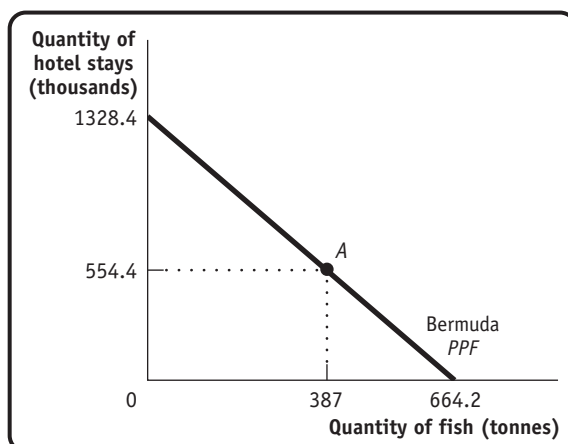


## Economic Models: Trade-offs and Trade

1. Two important industries on the island of Bermuda are fishing and tourism. According to data from the Food and Agriculture Organization of the United Nations and the Bermuda Department of Statistics, in the year 2009 the 306 registered fishers in Bermuda caught 387 tonnes of marine fish. And the 2719 people employed by hotels produced 554 400 hotel stays (measured by the number of visitor arrivals). Suppose that this production point is efficient in production. Assume also that the opportunity cost of 1 additional tonne of fish is 2000 hotel stays and that this opportunity cost is constant (the opportunity cost does not change).
  - a. If all 306 registered fishers were to be employed by hotels (in addition to the 2719 people already working in hotels), how many hotel stays could Bermuda produce?
  - b. If all 2719 hotel employees were to become fishers (in addition to the 306 fishers already working in the fishing industry), how many tonnes of fish could Bermuda produce?
  - c. Draw a production possibility frontier for Bermuda, with fish on the horizontal axis and hotel stays on the vertical axis, and label Bermuda's actual production point for the year 2009.

### Solution

1. a. Forgoing the production of 1 tonne of fish allows Bermuda to produce 2000 additional hotel stays. Therefore, forgoing the production of 387 tonnes of fish allows Bermuda to produce  $2000 \times 387 = 774\,000$  additional hotel stays. If all fishers worked in the hotel industry, Bermuda could produce  $554\,000 + 774\,000 = 1\,328\,400$  hotel stays.
- b. Forgoing the production of 2000 hotel stays allows Bermuda to produce 1 additional tonne of fish, so giving up 554 400 hotel stays allows Bermuda to produce  $554\,400 / 2000 = 277.2$  additional tonnes of fish. If all hotel employees worked in the fishing industry, Bermuda could produce  $387 + 277.2 = 664.2$  tonnes of fish.
- c. The accompanying diagram shows the production possibility frontier for Bermuda. Note that it is a straight line because the opportunity cost is constant. Point A is Bermuda's actual production point.



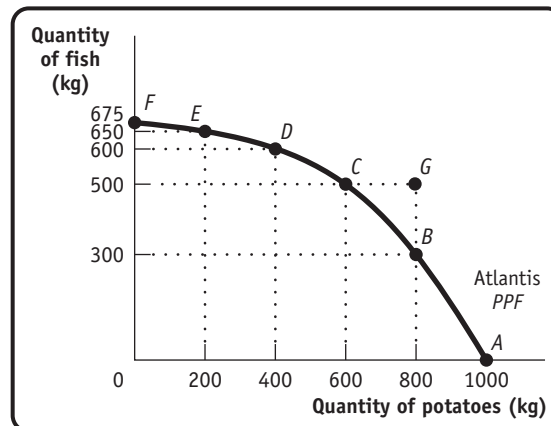
2. Atlantis is a small, isolated island in the South Atlantic. The inhabitants grow potatoes and catch fish. The accompanying table shows the maximum annual output combinations of potatoes and fish that can be produced. Obviously, given their limited resources and available technology, as they use more of their resources for potato production, there are fewer resources available for catching fish.

Maximum annual output options	Quantity of potatoes (kilograms)	Quantity of fish (kilograms)
A	1000	0
B	800	300
C	600	500
D	400	600
E	200	650
F	0	675

- Draw a production possibility frontier with potatoes on the horizontal axis and fish on the vertical axis illustrating these options, showing points A-F.
- Can Atlantis produce 500 kg of fish and 800 kg of potatoes? Explain. Where would this point lie relative to the production possibility frontier?
- What is the opportunity cost of increasing the annual output of potatoes from 600 to 800 kg?
- What is the opportunity cost of increasing the annual output of potatoes from 200 to 400 kg?
- Can you explain why the answers to parts (c) and (d) are not the same? What does this imply about the slope of the production possibility frontier?

## Solution

2. a. The accompanying diagram shows the production possibility frontier for Atlantis.



- No, Atlantis cannot produce 500 kg of fish and 800 kg of potatoes. If it produces 500 kg of fish, the most potatoes it can produce is 600 kg. This point would lie outside the production possibility frontier, at point G on the diagram.
- The opportunity cost of increasing output from 600 to 800 kg of potatoes is 200 kg of fish. If Atlantis increases output from 600 to 800 kg of potatoes, it has to cut fish production from 500 kg to 300 kg, that is, by 200 kg.

- d. The opportunity cost of increasing output from 200 to 400 kg of potatoes is 50 kg of fish. If Atlantis increases output from 200 to 400 kg of potatoes, it has to cut fish production from 650 kg to 600 kg, that is, by 50 kg.
  - e. The answers to parts (c) and (d) imply that the more potatoes Atlantis produces, the higher the opportunity cost becomes. For instance, as you grow more and more potatoes, you have to use less and less suitable land to do so. As a result, you have to divert increasingly more resources away from fishing as you grow more potatoes, meaning that you can produce increasingly less fish. This implies, of course, that the production possibility frontier becomes steeper the farther you move along it to the right; that is, the production possibility frontier is bowed out. (Mathematicians call this shape *concave*.)
3. According to Statistics Canada, 11.0 million hectares of land in Canada were used for wheat or corn farming in 2012. Of those 11.0 million hectares, farmers used 9.6 million hectares to grow 999.62 million bushels of wheat and 1.4 million hectares of land to grow 514.15 million bushels of corn. Suppose that Canada's wheat farming and corn farming are efficient in production. At that production point, the opportunity cost of producing 1 additional bushel of wheat is 1.7 fewer bushels of corn. However, because farmers have increasing opportunity costs at higher levels of wheat production, additional bushels of wheat have an opportunity cost greater than 1.7 bushels of corn. For each of the following production points, decide whether that production point is (i) feasible and efficient in production, (ii) feasible but not efficient in production, (iii) not feasible, or (iv) unclear as to whether or not it is feasible.
- a. Farmers use 1.6 million hectares of land to produce 180 million bushels of wheat, and they use 2.4 million hectares of land to produce 900 million bushels of corn. The remaining 7.0 million hectares are left unused.
  - b. From their original production point, farmers transfer 1.6 million hectares of land from corn to wheat production. They now produce 1009.62 million of bushels of wheat and 497.15 million bushels of corn.
  - c. Farmers reduce their production of wheat to 950 million bushels and increase their production of corn to 588.58 million bushels. Along the production possibility frontier, the opportunity cost of going from 514.15 million bushels of corn to 588.58 million bushels of corn is 0.666 bushels of wheat per bushel of corn.

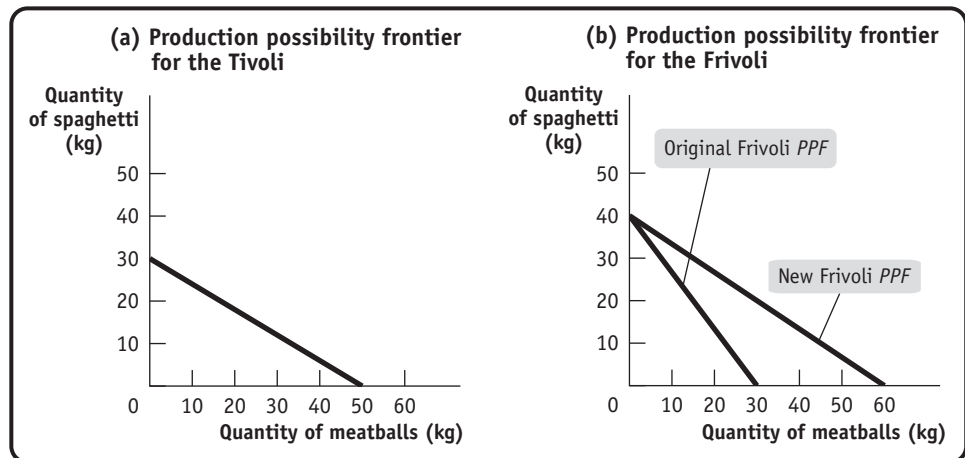
## Solution

3. a. If resources are left unused, then this combination of production must lie inside the production possibilities frontier. So it is feasible, but it cannot be efficient.
- b. The transfer of resources has increased wheat production by 10 million bushels and reduced corn production by 17 million bushels. This is the opportunity cost given in the question, so production is moving to another point on the production possibilities frontier. Therefore, it is both feasible and efficient.
- c. The increase in the production of corn led to a decline in wheat production of 49.62 million bushels ( $999.62 - 950$ ). If the opportunity cost is 0.666 bushels of wheat per bushel of corn, then we should get about 75.5 million more bushels of corn, which is the extra amount of corn produced. So the economy is again moving along its production possibilities frontier and the production point is feasible and efficient.

4. In the ancient country of Roma, only two goods, spaghetti and meatballs, are produced. There are two tribes in Roma, the Tivoli and the Frivoli. By themselves, the Tivoli each month can produce either 30 kg of spaghetti and no meatballs, or 50 kg of meatballs and no spaghetti, or any combination in between. The Frivoli, by themselves, each month can produce 40 kg of spaghetti and no meatballs, or 30 kg of meatballs and no spaghetti, or any combination in between.
- Assume that all production possibility frontiers are straight lines. Draw one diagram showing the monthly production possibility frontier for the Tivoli and another showing the monthly production possibility frontier for the Frivoli. Show how you calculated them.
  - Which tribe has the comparative advantage in spaghetti production? In meatball production?
- In A.D. 100 the Frivoli discover a new technique for making meatballs that doubles the quantity of meatballs they can produce each month.
- Draw the new monthly production possibility frontier for the Frivoli.
  - After the innovation, which tribe now has an absolute advantage in producing meatballs? In producing spaghetti? Which has the comparative advantage in meatball production? In spaghetti production?

## Solution

4. a. The accompanying diagram shows the production possibility frontier for the Tivoli in panel (a) and for the Frivoli as the line labelled “Original Frivoli PPF” in panel (b).



The production possibility frontier for the Tivoli was calculated as follows: the Tivoli can produce either 30 kg of spaghetti and no meatballs, or they can produce no spaghetti but 50 kg of meatballs. That is, the opportunity cost of 1 kg of meatballs is  $\frac{3}{5}$  of a kg of spaghetti: in order to produce 1 more kg of meatballs, the Tivoli have to give up  $\frac{3}{5}$  of a kg of spaghetti. This means that the slope of their production possibility frontier is  $-\frac{3}{5}$ . A similar argument for the Frivoli shows that their production possibility frontier has a slope of  $-\frac{4}{3}$ .

- For the Tivoli, the opportunity cost of 1 kg of meatballs is  $\frac{3}{5}$  of a kg of spaghetti. For the Frivoli, the opportunity cost of 1 kg of meatballs is  $\frac{4}{3}$  kg of spaghetti. That is, the Tivoli have a comparative advantage in meatball production because their opportunity cost is lower. For the Tivoli, the opportunity cost of 1 kg of spaghetti is  $\frac{5}{3}$  kg of meatballs. For the Frivoli, the opportunity cost of 1 kg of spaghetti is  $\frac{3}{4}$  kg of meatballs. That is, the Frivoli have a comparative advantage in spaghetti production because their opportunity cost is lower.

- c. The Frivoli's new production possibility frontier is the line labelled "New Frivoli PPF" in panel (b) of the diagram. Instead of producing 30 kg of meatballs (if they produce no spaghetti), they can now produce 60 kg.
  - d. Now the Frivoli have the absolute advantage in both meatball production and spaghetti production. The Frivoli's opportunity cost of meatballs has now fallen to  $\frac{4}{6} = \frac{2}{3}$ ; that is, for each kilogram of meatballs that the Frivoli now produce, they have to give up producing  $\frac{2}{3}$  of a kilogram of spaghetti. Since the Frivoli's opportunity cost of meatballs ( $\frac{2}{3}$ ) is still higher than the Tivoli's ( $\frac{3}{5}$ ), the Tivoli still have the comparative advantage in meatball production. The Frivoli's opportunity cost of spaghetti is  $\frac{3}{2}$  kg of meatballs and the Tivoli's is  $\frac{5}{3}$  kg of meatballs, so the Frivoli have the comparative advantage in spaghetti production.
5. According to the Canadian International Merchandise Trade Database from Statistics Canada, in December 2012, Canada sold aircraft and spacecraft worth \$27.23 million to China and bought aircraft and spacecraft worth only \$8.1 million from China. During the same month, however, Canada bought \$255.1 million worth of apparel and clothing accessories from China but sold only \$56 253 worth of apparel and clothing accessories to China. Using what you have learned about how trade is determined by comparative advantage, answer the following questions.
- a. Which country has the comparative advantage in aircraft production? In production of apparel and clothing accessories?
  - b. Can you determine which country has the absolute advantage in aircraft production? In apparel and clothing accessories?

## Solution

5. a. If trade is taking place according to comparative advantage, then we can conclude that Canada has a comparative advantage in aircraft production and China has a comparative advantage in clothing.
- b. No, we can't say because trade depends only on comparative, not absolute, advantage.
6. Peter Pundit, an economics reporter, states that the European Union (EU) is increasing its productivity very rapidly in all industries. He claims that this productivity advance is so rapid that output from the EU in these industries will soon exceed that of Canada and, as a result, Canada will no longer benefit from trade with the EU.
- a. Do you think Peter Pundit is correct or not? If not, what do you think is the source of his mistake?
  - b. If the EU and Canada continue to trade, what do you think will characterize the goods that the EU sells to Canada and the goods that Canada exports to the EU?

## Solution

6. a. Peter Pundit is not correct. He confuses absolute and comparative advantage. Even if the EU had an absolute advantage over Canada in every product it produced, Canada would still have a comparative advantage in some products. And Canada should continue to produce those products: trade will make both the EU and Canada better off.
- b. You should expect to see the EU export those goods in which it has the comparative advantage and Canada export those goods in which it has the comparative advantage.

7. You are in charge of allocating residents to your dormitory's baseball and basketball teams. You are down to the last four people, two of whom must be allocated to baseball and two to basketball. The accompanying table gives each person's batting average and free-throw average.

Name	Batting average	Free-throw average
Kelley	70%	60%
Jackie	50%	50%
Curt	10%	30%
Yui	80%	70%

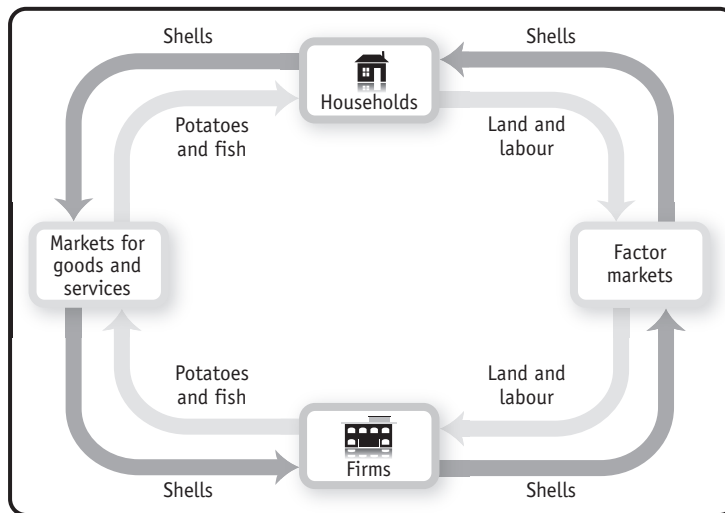
- Explain how you would use the concept of comparative advantage to allocate the players. Begin by establishing each player's opportunity cost of free throws in terms of batting average.
- Why is it likely that the other basketball players will be unhappy about this arrangement but the other baseball players will be satisfied? Nonetheless, why would an economist say that this is an efficient way to allocate players for your dormitory's sports teams?

## Solution

- Let's begin by establishing the opportunity cost of free throws for each player. If you allocate Kelley to the basketball team, the team gains a player with a 60% free-throw average and the baseball team loses a player with a 70% batting average. That is, the opportunity cost of allocating Kelley to the basketball team is  $\frac{7}{6}$ . Similarly, Jackie's opportunity cost of playing basketball is 1; Curt's opportunity cost of playing basketball is  $\frac{1}{3}$ , and Yui's opportunity cost of playing basketball is  $\frac{7}{7}$ . Jackie and Curt have the lowest opportunity costs of playing basketball; that is, they have the comparative advantage in basketball. Therefore, they should be allocated to the basketball team. Kelley and Yui have the comparative advantage in baseball and should therefore play on the baseball team.
  - It is likely that the basketball team will be unhappy with this arrangement. Both Jackie and Curt have an absolute disadvantage at playing basketball, compared to the other two players. (They also have an absolute disadvantage at playing baseball, but they are comparatively less bad at basketball than at baseball.) The baseball team is likely to be happy about this allocation because both Kelley and Yui have an absolute advantage at playing baseball. However, if you are concerned with the total number of wins for the dormitory (as an economist who would be concerned about efficiency), this allocation is the best one: it maximizes the overall chances of the dormitory winning at any sport.
- The inhabitants of the fictional economy of Atlantis use money in the form of cowry shells. Draw a circular-flow diagram showing households and firms. Firms produce potatoes and fish, and households buy potatoes and fish. Households also provide the land and labour to firms. Identify where in the flows of cowry shells or physical things (goods and services, or resources) each of the following impacts would occur. Describe how this impact spreads around the circle.
  - A devastating hurricane floods many of the potato fields.
  - A very productive fishing season yields a very large number of fish caught.
  - The inhabitants of Atlantis discover Shakira and spend several days a month at dancing festivals.

## Solution

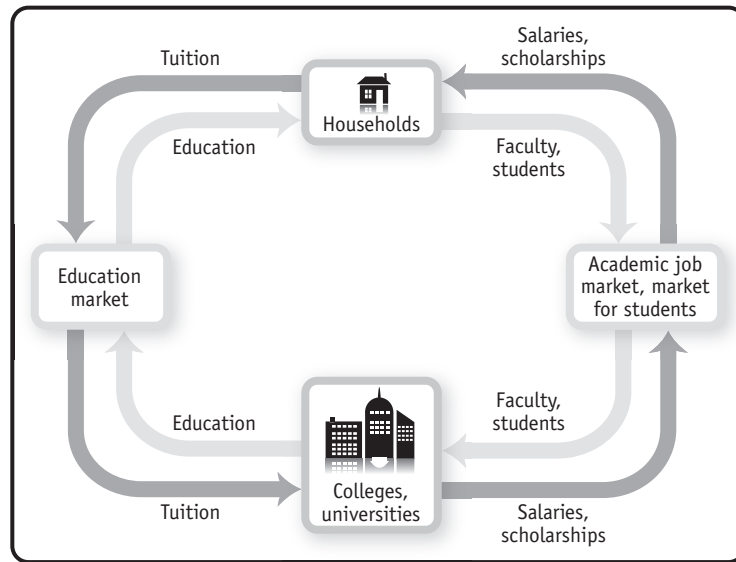
8. The accompanying diagram illustrates the circular flow for Atlantis.



- The flooding of the fields will destroy the potato crop. Destruction of the potato crop reduces the flow of goods from firms to households: fewer potatoes produced by firms now are sold to households. An implication, of course, is that fewer cowry shells flow from households to firms as payment for the potatoes in the market for goods and services. Since firms now earn fewer shells, they have fewer shells to pay to households in the factor markets. As a result, the amount of factors flowing from households to firms is also reduced.
  - The productive fishing season leads to a greater quantity of fish produced by firms to flow to households. An implication is that more money flows from households to firms through the markets for goods and services. As a result, firms want to buy more factors from households (the flow of shells from firms to households increases) and, in return, the flow of factors from households to firms increases.
  - Time spent at dancing festivals reduces the flow of labour from households to firms and therefore reduces the number of shells flowing from firms to households through the factor markets. In return, households now have fewer shells to buy goods with (the flow of shells from households to firms in the markets for goods and services is reduced), implying that fewer goods flow from firms to households.
9. An economist might say that colleges and universities “produce” education, using faculty members and students as inputs. According to this line of reasoning, education is then “consumed” by households. Construct a circular-flow diagram to represent the sector of the economy devoted to college education: colleges and universities represent firms, and households both consume education and provide faculty and students to universities. What are the relevant markets in this diagram? What is being bought and sold in each direction? What would happen in the diagram if the government decided to subsidize 50% of all college and university students’ tuition?

## Solution

9. The accompanying diagram shows the circular flow for the education sector.



Colleges and universities buy faculty on the academic job market and attract students from the market for students. (Many colleges and universities actively try to attract good students by offering scholarships and the like.) They sell education to households in the market for education, and households buy education in that market from one (or sometimes several) of the sellers.

If the government subsidized half of all students' tuition, households would demand more education. As a result, colleges and universities would hire more faculty and accept more students, meaning that more money in terms of salaries and scholarships would flow from universities and colleges to the households.

10. Your dormitory roommate plays loud music most of the time; you, however, would prefer more peace and quiet. You suggest that she buy some earphones. She responds that although she would be happy to use earphones, she has many other things that she would prefer to spend her money on right now. You discuss this situation with a friend who is an economics major. The following exchange takes place:
- He: How much would it cost to buy earphones?*  
*You: \$15.*  
*He: How much do you value having some peace and quiet for the rest of the semester?*  
*You: \$30.*  
*He: It is efficient for you to buy the earphones and give them to your roommate. You gain more than you lose; the benefit exceeds the cost. You should do that.*  
*You: It just isn't fair that I have to pay for the earphones when I'm not the one making the noise.*
- Which parts of this conversation contain positive statements and which parts contain normative statements?
  - Construct an argument supporting your viewpoint that your roommate should be the one to change her behaviour. Similarly, construct an argument from the viewpoint of your roommate that you should be the one to buy the earphones. If your dormitory has a policy that gives residents the unlimited right to play music, whose argument is likely to win? If your dormitory has a rule that a person must stop playing music whenever a roommate complains, whose argument is likely to win?

## Solution

- 10.** a. “It is efficient for you to buy the earphones” is a positive statement (it is either right or wrong); that is, it is about description. “You should do that” (that is, buy the earphones) is strictly speaking a normative statement; that is, it is about prescription (although you would find all economists agree that all trades that improve efficiency should be made). “It just isn’t fair” is a normative statement—that is, it is about prescription—and you would likely find much disagreement about the fairness of the proposed trade.
- b. One argument that your roommate should buy the earphones is that everyone has the right to peace and quiet. If your roommate therefore wants to listen to music, she should have to be responsible for making sure that others’ peace and quiet is not disturbed. Your roommate might argue that since she has the right to play as much music as she wants, it is your responsibility to make sure that you are not disturbed—for instance, by buying her earphones. If the dormitory has a policy that establishes the right to unlimited music, your roommate’s argument wins. If the rule is that there is a right to peace and quiet, your argument wins.
- 11.** A representative of the Canadian clothing industry recently made the following statement: “Workers in Asia often work in sweatshop conditions earning only pennies an hour. Canadian workers are more productive and as a result earn higher wages. In order to preserve the dignity of the Canadian workplace, the government should enact legislation banning imports of low-wage Asian clothing.”
- a. Which parts of this quote are positive statements? Which parts are normative statements?
- b. Is the policy that is being advocated consistent with the preceding statements about the wages and productivities of Canadian and Asian workers?
- c. Would such a policy make some Canadians better off without making any other Canadians worse off? That is, would this policy be efficient from the viewpoint of all Canadians?
- d. Would low-wage Asian workers benefit from or be hurt by such a policy?

## Solution

- 11.** a. The first two sentences contain the positive statements about wages and about productivity and its connection with wages. The last sentence, recommending the ban on imports, is normative.
- b. The policy advocated could be consistent with the positive statements. The statements about wages and productivity are related to absolute advantage. However, the Asian workers could have a comparative advantage (and in reality do have a comparative advantage). Without protection against imports, the Canadian workers could be displaced by cheaper imports. If “preserving the dignity of the Canadian workplace” means those workers keeping their jobs, then protection might be necessary (unless the Canadian workers have some special niche market).
- c. The policy would make Canadian clothing workers better off, but the buyers of cheap imported clothing worse off. By moving the country away from its areas of comparative advantage, total incomes in Canada would have to be lower; the policy would therefore be inefficient from the viewpoint of all Canadians.
- d. Some low-wage Asian workers would be worse off if exports to Canada stopped. As with Canada, Asia would have some resources moved out of the sector where it has a comparative advantage, so total incomes would fall.

- 12.** Are the following statements true or false? Explain your answers.
- a. “When people must pay higher taxes on their wage earnings, it reduces their incentive to work” is a positive statement.
  - b. “We should lower taxes to encourage more work” is a positive statement.
  - c. Economics cannot always be used to completely decide what society ought to do.
  - d. “The system of public education in this country generates greater benefits to society than the cost of running the system” is a normative statement.
  - e. All disagreements among economists are generated by the media.

- 12.** **a.** True. This is a positive statement. It has a factual answer; that is, it is either right or wrong. There has been some debate about whether the statement is actually true or false, but in principle there is only one answer.
- b.** False. This is a statement about what we should do, and this statement has no clearly right or wrong answer. Your view will depend on whether you think encouraging more work is a good or a bad idea.
- c.** True. Economics is best at giving positive answers, for instance, answers about what the most efficient way is of achieving a certain aim. The question of how society ought to be organized is mostly decided in the realm of politics.
- d.** False. This is a positive statement. In principle, it has an answer that is either right or wrong.
- e.** False. Some disagreements among economists arise from the fact that in building a model, one economist thinks that a certain abstraction from reality is admissible but another economist may think that that abstraction is not admissible. Some disagreements arise from the fact that economists sometimes disagree about values.

- 13.** Evaluate the following statement: “It is easier to build an economic model that accurately reflects events that have already occurred than to build an economic model to forecast future events.” Do you think this is true or not? Why? What does this imply about the difficulties of building good economic models?

- 13.** True. With hindsight it is easier to see the important features of the situation that a model should have captured. For predictive purposes, a model needs to anticipate which features of reality are important (and so should be included) and which are unimportant (and so can be ignored). This is why the famed British economist John Maynard Keynes referred to economics as an art as well as a science.

- 14.** Economists who work for the government are often called on to make policy recommendations. Why do you think it is important for the public to be able to differentiate normative statements from positive statements in these recommendations?

- 14.** Positive statements are those based on fact—or at least on our best estimate of what the facts are. Therefore, these statements are also those that do not depend on the political views of the economist. Normative statements may sometimes be influenced by the economist’s own values. Whether someone agrees with an economist’s normative statement may depend on whether they share values. It is therefore important that the public be able to distinguish normative from positive statements.

- 15.** The mayor of Gotham City, worried about a potential epidemic of deadly influenza this winter, asks an economic adviser the following series of questions. Determine whether a question requires the economic adviser to make a positive assessment or a normative assessment.
- a. How much vaccine will be in stock in the city by the end of November?
  - b. If we offer to pay 10% more per dose to the pharmaceutical companies providing the vaccines, will they provide additional doses?
  - c. If there is a shortage of vaccine in the city, whom should we vaccinate first—the elderly or the very young? (Assume that a person from one group has an equal likelihood of dying from influenza as a person from the other group.)
  - d. If the city charges \$25 per shot, how many people will pay?
  - e. If the city charges \$25 per shot, it will make a profit of \$10 per shot, money that can go to pay for inoculating poor people. Should the city engage in such a scheme?

### Solution

- 15.**
- a. Positive
  - b. Positive
  - c. Normative
  - d. Positive
  - e. Normative
- 16.** Assess the following statement: “If economists just had enough data, they could solve all policy questions in a way that maximizes the social good. There would be no need for divisive political debates, such as whether the government should provide free medical care for all.”

### Solution

- 16.** What is true is that if economists had enough data, they could predict precisely what the outcome would be of any proposed policy (such as free medical care). That is, economists can answer positive questions. But no amount of data can lead to a determination about what a society should do—that is a normative question. An economist can predict how much it will cost to provide free medical care and what effects different ways of raising taxes will have on people’s behaviour (for instance, a sales tax will reduce consumption behaviour; an income tax may discourage workers from working as much as before). But whether this is a trade-off worth making is a question that can be answered only in political discourse.



# chapter 2

## Economic Models: Trade-offs and Trade

### Chapter Objectives

- Explain why models play a crucial role in economics.
- Present two simple but important models: the production possibilities frontier and comparative advantage.
- Present the circular-flow diagram.
- Explain the difference between positive and normative economics.
- Explain why economists do not always agree.

### Chapter Outline

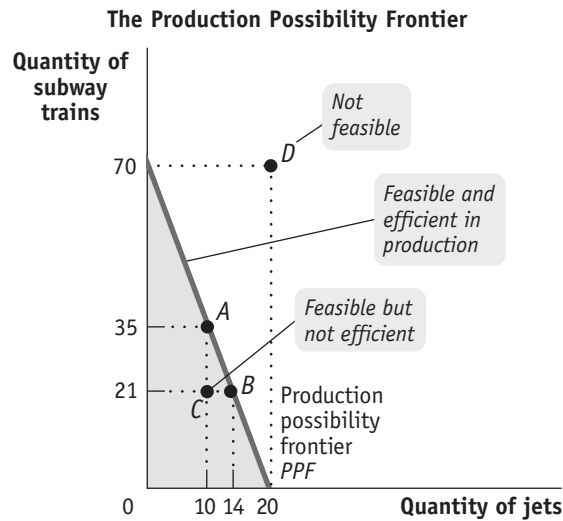
**Opening Example:** The Wright Brothers invented a wind tunnel to test models of airplanes. Boeing ran 15 000 hours of wind tunnel tests when it was developing its latest jet, the Dreamliner. Testing models is cheaper and safer than building full-scale versions. Economists use models in the same way.

#### I. Models in Economics: Some Important Examples

- A. *Definition:* A **model** is a simplified representation of a real situation that is used to better understand real-life situations.
- B. Models allow economists to see the effects of only one change at a time.
- C. *Definition:* The **other things equal assumption** (*ceteris paribus*) means that all other relevant factors remain unchanged.
- D. Economic models make use of mathematical tools, especially graphs.

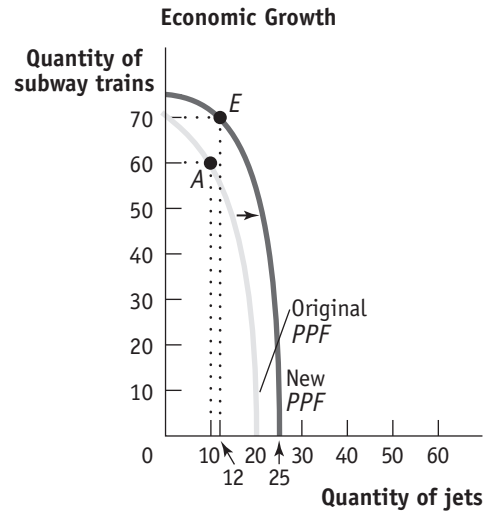
#### II. Trade-offs: The Production Possibility Frontier

- A. *Definition:* The **production possibility frontier** illustrates the trade-offs facing an economy that produces only two goods. It shows the maximum quantity of one good that can be produced with available resources and technology for any given production of the other.
- B. The graph of the production possibilities frontier shows the possible combinations of two goods which can be produced given the scarce resources of the society.
- C. A point inside the frontier is a feasible combination of two goods that can be produced, but does not use all resources fully, and a point outside the frontier is not feasible given the current amount of resources. See text Figure 2-1, shown next.



D. The production possibility model illustrates the concepts of:

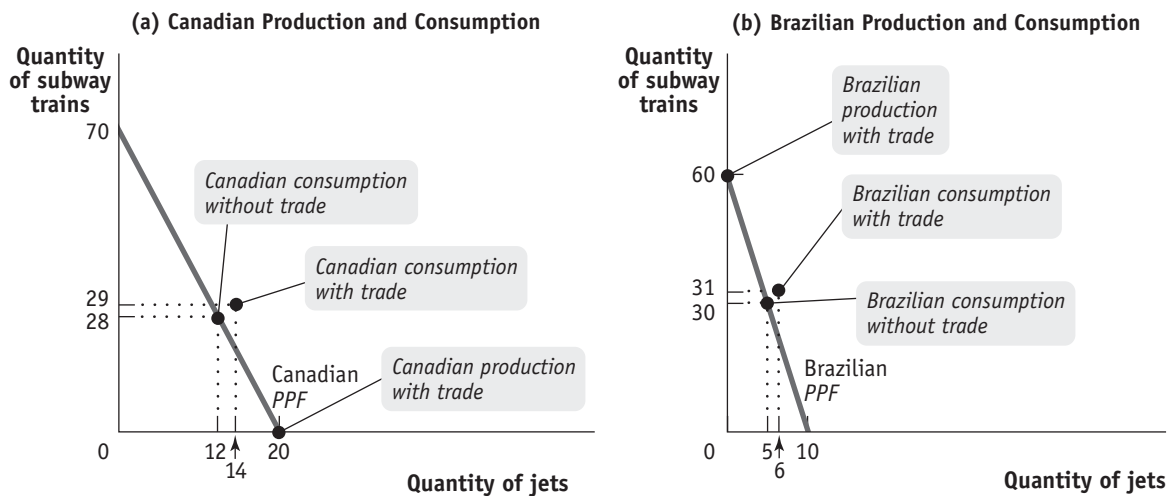
1. **Efficiency:** Any point on the frontier represents an efficient use of resources, and any combination of goods inside the frontier represents a point of inefficiency.
  - a. If an economy produces on its production possibilities frontier, it is *efficient in production*.
  - b. An economy is *efficient in allocation* if it allocates resources so that consumers are as well off as possible.
2. **Opportunity costs:** The negative slope of the frontier means that an increase in the production of one good must require a sacrifice of some quantity of the other good.
3. **The case of increasing costs:** If the frontier is bowed out, the opportunity costs increase as more of one good is produced because resources are not easily transferable from the production of one good to another.
4. **Economic growth:** Over time as a society gains more resources, the production possibility frontier shifts outward. See text Figure 2-3, shown on the next page.
  - a. Economic growth comes from two basic sources: an increase in factors of production, and changes in technology.
  - b. **Definition: Factors of production** are resources used to produce goods and services.
  - c. **Definition: Technology** is the technical means for producing goods and services.



### III. Comparative Advantage and Gains from Trade

- A. *Definition:* An individual has a **comparative advantage** in producing a good if the opportunity cost of producing the good is lower for that individual than for other people. The same principle holds for countries.
- B. *Definition:* An individual has an **absolute advantage** in an activity if he or she can do it better than other people can. Having an absolute advantage is not the same thing as having a comparative advantage.
- C. Comparative advantage, not absolute advantage, is the basis for the gains from trade.
- D. The gains from trade are illustrated in text Figure 2-5 (shown next), with a straight-line production possibility frontier for each of two countries:

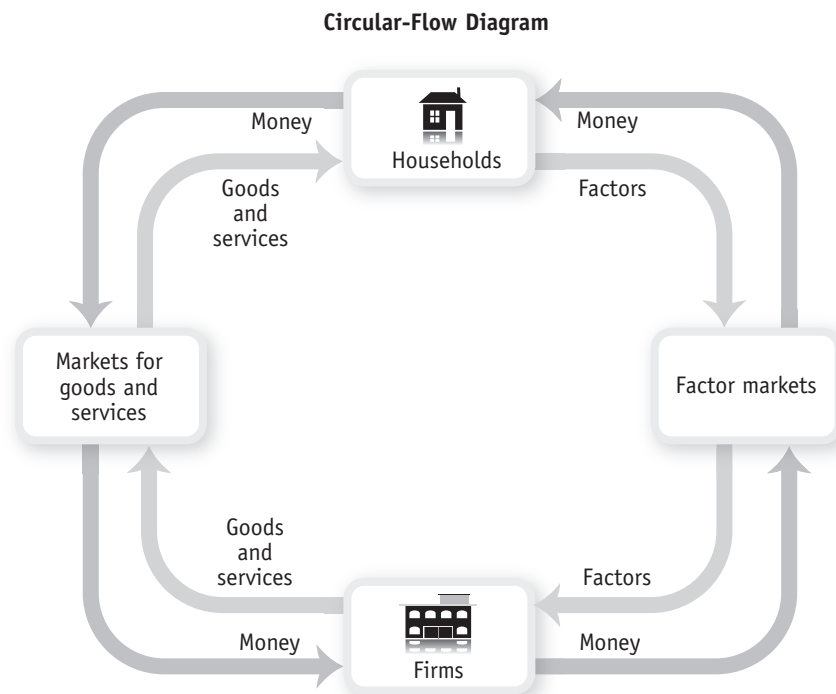
#### Comparative Advantage and International Trade



- E. Individuals or countries will engage in trade only if the price of the good each is obtaining from trade is less than its own opportunity cost of producing the good.

#### IV. Transactions: The Circular-Flow Diagram

- A. *Definition:* Trade takes the form of **barter** when people directly exchange goods they have for goods they want.
- B. *Definition:* The **circular-flow diagram** is a model that represents the transactions in an economy by flows around a circle.
- C. *Definition:* A **household** is a person or a group of people who share their income.
- D. *Definition:* A **firm** is an organization that produces goods for sale.
- E. *Definition:* Firms sell goods and services that they produce to households in **markets for goods and services**.
- F. *Definition:* Firms buy the resources they need to produce—**factors of production**—in **factor markets**.
- G. *Definition:* **Income distribution** is the way in which total income is divided among the owners of the various factors of production.
- H. The circular-flow diagram is a simplified picture of an economy, as demonstrated in text Figure 2-6, shown here.



#### V. Positive versus Normative Economics

- A. *Definition:* **Positive economics** is the branch of economic analysis that describes the way the economy actually works.
- B. *Definition:* **Normative economics** makes prescriptions about the way the economy should work.
- C. *Definition:* A **forecast** is a simple prediction of the future.
- D. Models are especially helpful in answering “what if” questions such as, How will revenues change with a tax cut? The answer is a predictive one, not prescriptive; it does not tell you if the policy is good or bad.

- E. Economists do engage in normative economics. Economic analysis can be used to show that some policies are clearly better than others, especially if one solution is more efficient than another. For example, most economists would favour subsidies to renters over rent-control laws as a more efficient solution.

## VI. When and Why Economists Disagree

- A. Because economists have used different models and made differing simplifying assumptions, they can arrive at different conclusions. Many disagreements are eventually resolved by the accumulation of evidence.
- B. Economists may also have different value judgements, for example, about what constitutes a fair distribution of income. These are normative disagreements.
- C. Economic analysis is a method, not a set of conclusions.

## Teaching Tips

### Models in Economics

#### *Creating Student Interest*

Ask students why economists (and economics students) use simplified models. (Because the real world is too complex to consider everything at once. You want to use a more complicated model only if the benefits of added understanding exceed the costs of added difficulty and complexity.)

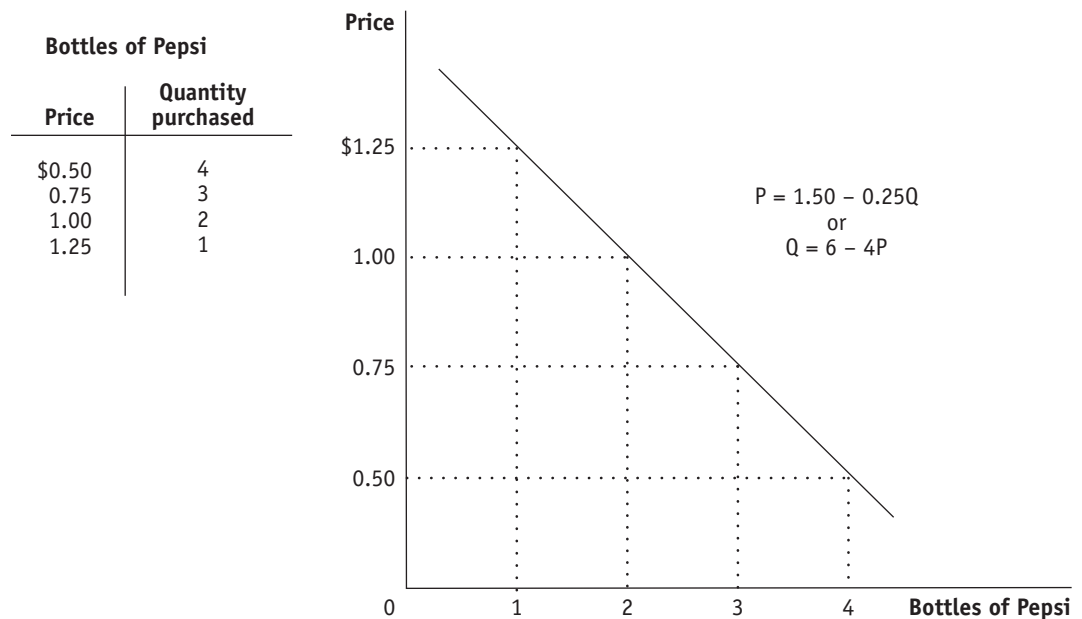
Construct a paper airplane during class. When you are finished, ask the students what you have made. Give your airplane a test flight. Have the class identify the ways the paper airplane is like a real airplane (for instance, it has wings, it flew). If they have trouble, remind them that they knew what it was, so there must have been some things in common! Have the class identify the ways it is not like a real airplane (size, weight, other details, it did not fly). The paper airplane can help an aerodynamics student learn the basic principles of flight (without the complexity of a 747), just as economic models can help students learn about the basic principles of economics. As understanding increases, so can the complexity of the models used.

An alternative to the paper airplane example is a simple smiley face drawn on the board or an emoticon used in text messages, :) or 😊. Use these representations to have the same discussion with students. How is the image like a real smiling face and how is it different? Why is it so useful in text messaging? (It is simplified and we all know what it means.) How might the level of complexity be increased for the smiley face model? (Add ears, hair.)

#### *Presenting the Material*

After introducing the idea of a model as a simplified representation of reality (airplane or smiley face), segue into models in economics by asking students how they think economists represent reality. Try to get students to identify types of economic models. Help them by asking what representations they see when looking through their textbook. They should be able to identify tables, graphs, and equations as representations of economic models.

Explain that in later chapters they will learn the law of demand. Ask them what happens to the amount of a good that they purchase when its price rises. Most students will know that people buy less when the price rises and buy more when the price falls. The concept will be easy for them to understand. (They don't need an economics course to figure out the law of demand!) Tell the students that they already know an important economic "law." Show them how economists model (represent) the law of demand using a demand schedule, a graph and an equation (see next page).



## Trade-offs: The Production Possibilities Frontier

### *Creating Student Interest*

Introduce the production possibilities model by evoking the image of a person (or people) stranded on an island. This could be Robinson Crusoe, Gilligan, Tom Hanks in *Cast Away*, contestants on “Survivor”—have your students select the image that they can relate to the most. Present that as an example of the simplest economy you can imagine. Explain to students that you are going to build a model of the economy on the island. Have students list the limited resources available on the island (for example, trees, sand, water, fish, labour, entrepreneurship). Then have the class consider the immediate needs that must be met using these resources (food, shelter). Explain that the model will represent production in the island economy.

### *Presenting the Material*

Use students “producing” grades as a simple example of a production possibility frontier. Put economics on the vertical axis of a graph and accounting on the horizontal axis. Students’ time and energy are fixed for the moment, and putting more time into one subject involves a lower grade in the other subject. (Assuming that the student is equally efficient in “producing” both subjects, the production possibilities graph is a straight line.) Points on the frontier show the possible combinations of grades that the student can achieve.

Use an example of a country that can produce wheat or airplanes. Here are the points on the production possibility frontier:

Maximum annual output options	Wheat	Airplanes
A	1000	0
B	800	150
C	600	250
D	400	325
E	200	375
F	0	400

Ask students: What is the opportunity cost of expanding production from 150 airplanes to 250 airplanes? (200 wheat.) Why is the production possibility graph negatively sloped? (Given scarcity, producing more of one good means producing less of the other.) Why is it bowed out from the origin? (That reflects increasing opportunity costs. Perhaps not all resources are equally good at producing both goods.)

## Comparative Advantage and Gains from Trade

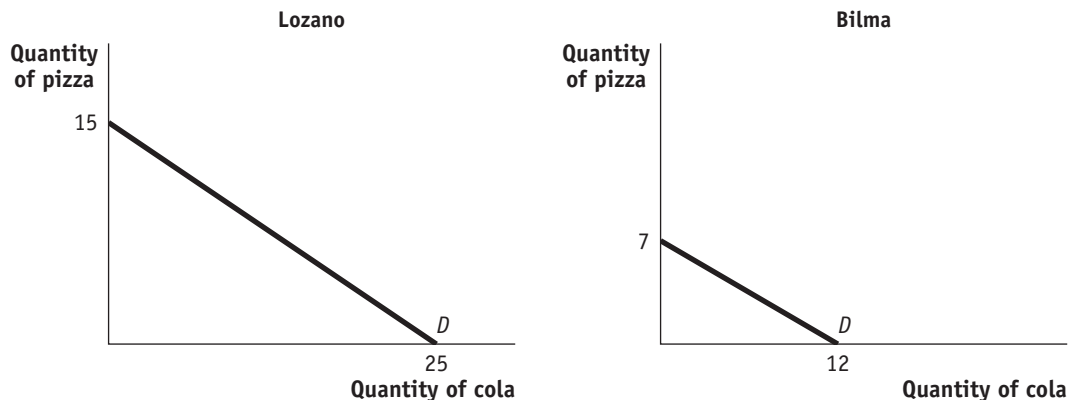
### *Creating Student Interest*

Ask students if they agree with the idea that, if it is cheaper to buy a product from another country than to make it yourself, you should buy it from the other country.

Provoke a discussion by asking students if the Canadian economy would be better off without importing so many clothing items from Bangladesh. Get them to start thinking about the idea that every action has a benefit and a cost. Who benefits from being able to import clothing from Bangladesh? (Consumers, because the clothing is cheaper.) Who loses as a result of importing more clothing from Bangladesh? (Domestic producers, because factories close and jobs are lost.)

### *Presenting the Material*

Give a simple example of two economies that can produce the following two goods, in the same time period, with a fixed amount of resources. Assume a straight line production possibility frontier.



Indicate that Lozano has an absolute advantage in both goods. Students often need help in seeing how to calculate the opportunity costs of producing both goods in each country. The opportunity cost of pizza in Lozano is the ratio of cola to pizza, or  $25/15 = 1.67$ , and the opportunity cost of pizza in Bilma is  $12/7 = 1.7$ . Thus, Lozano has the comparative advantage in pizza and Bilma has the comparative advantage in producing cola.

## Transactions: The Circular-Flow Diagram

### *Creating Student Interest*

Use the example of a dollar in your pocket. Explain where the dollar came from. (It came from your bank account, it was put there by a direct deposit from your university.) Consider where the dollar will go. (You will buy lunch and leave it as a tip, it will become income for a waitress and then she will have money to spend.) Ask students to think about the last dollar they spent. Where did it come from and where did it go?

### ***Presenting the Material***

Identify and define the two major components of the circular-flow diagram first: households and firms. Then draw in the upper loop—the spending loop—of the circular-flow model. Use a concrete example of their spending money on clothes at a local store. Then add the bottom loop of the model, the factor market. Use a concrete example of their earning wages from a job.

Use your ample artistic skills to draw a house on the left side of the board and a factory on the right. Tell the class these represent *households* and *firms*. Create the circular-flow diagram by asking students the following series of questions. (It will help some students to see the step-by-step construction of the diagram in addition to the completed diagram in the text.)

What do households get from the firms? (Goods and services.) Draw an arrow above the pictures from the firm to the households and label it “goods and services.”

What do the firms get in exchange for the goods and services? (Payment/money.) Draw a line above the pictures back from the households to the firm and label it “\$.”

What do the households provide to the firms? (Worker/labour—add that they provide the other resources also.) Draw a line below the pictures from the household to the firm and label it “resources.”

What do the households get from the firm in return for their labour/resources? (Payments—wages, rent, interest, profit.) Draw a line below the pictures back from the firm to the households and label it “wages, rent, interest, profit.”

Point out that the top flow is the *product market* (market for products) and the bottom flow is the *factor market* (market for factors of production). You may want to link changes in the size of the flows to the business cycle discussed in Chapter 1. During expansions, the flow increases; during recessions, it decreases.

## **Positive versus Normative Economics**

### ***Creating Student Interest***

Find an estimate of the average annual tuition at your institution. Write the estimate on the board and tell students you want them to know two things about this number (write them on the board): First, it is the average annual tuition at your institution. Second, this amount is too low. Tell them to write down the two statements. This should cause one or more students to express disagreement with at least one of the statements. If not, ask them if they agree with them or not (and why). Use the statements to lead into your presentation of positive versus normative in economics.

### ***Presenting the Material***

After explaining the difference between positive and normative, quiz the class by asking them to determine if each of the following statements is positive or normative. If a student identifies the statement as positive, ask how the statement could be tested. Remind them that a positive statement need not be correct, it only needs to be testable. Also remind them that even if everyone agrees with a normative statement, it is still normative.

Tell students that the top marginal federal income tax rate in Canada is 29% (on taxable incomes over \$136 270 in 2014). (That’s a positive statement.) To update, see the Canada Revenue Agency’s website: <http://www.cra-arc.gc.ca/tx/ndvdl/fq/txrts-eng.html>

Then ask them: should that top marginal rate be higher or lower? Or should we have a separate top marginal rate, as some advocate, for incomes much higher than this? What about those making tens of millions every year?

The price of gas is too high. (Normative: What is “too high”?)

The Bank of Canada lowered interest rates yesterday. (Positive: You can test this by going to The Bank of Canada website or by looking at interest rates.)

The national debt should be reduced. (Normative: How can you know/test what “should” be done?)

Foreign imports are bad for the economy. (Normative: How do you define “bad”?)

Inflation is expected to rise. (Positive: You can survey people and see/test whether they *expect* inflation to rise.)

## Common Student Pitfalls

- **Misunderstanding comparative advantage.** Students confuse absolute advantage with comparative advantage. Explain that absolute advantage means you can produce more than someone else can. Comparative advantage means that you can produce something at a lower opportunity cost than someone else.

Use the example of two students working on a joint project. One student may be better at every task required to complete the project (have an absolute advantage in all tasks). However, it wouldn’t be efficient to have the one student do everything for the project while the other does nothing. There must be a task that the other student is relatively good at (has a comparative advantage). The pair should identify that task and have the students specialize accordingly.

Most students understand the basic idea behind comparative advantage, but many students struggle with the calculation of opportunity cost. They may need to see and work a few examples before the concept sinks in. Start with the example from the text, and then move on to other examples.

- **The use of the term positive.** Students may not understand the different use of the word *positive*. (It comes from ‘logical positivism’ in philosophy.) Make sure they understand that it is not being used in the same way they are familiar with (the opposite of negative). There are many places where economists use generally familiar words to mean something specific to their discipline. Prepare them to get used to learning the new meanings in these cases. In this context, “positive economics” explains the way the world works. It is factual and can therefore be tested.

## Case Studies in the Text

### Economics in Action

*Rich Nation, Poor Nation*—Much of our clothing is produced in another country much poorer than Canada. The case study explains that this is because the countries have a comparative advantage in producing clothing.

Ask students the following questions:

1. Why are some countries poor? (Their workers are not as productive as workers in richer economies. This is not because these workers don’t work hard; they have less capital, both human and physical, to work with.)
2. Why do consumers in Canada import so much cheap clothing from poor countries? (Despite their poverty, poor countries have a comparative advantage in producing clothing relative to Canada.)

*Economists, Beyond the Ivory Tower*—This EIA discusses the various roles that economists play in the business world, and in government and international organizations.

Ask students the following questions:

1. Why do companies in the private sector hire economists? (To forecast and predict what will happen to prices.)
2. Why does the government employ large numbers of economists? (To analyze the economic effects of government decisions.)

## For Inquiring Minds

*The Model That Ate the Economy*—This FIM discusses a model used by financial traders on Wall Street, beginning in 2000, to estimate the likelihood of losing money on mortgage-backed securities (MBTs). As subsequent economic events proved, the model seriously underestimated the risk of buying the MBTs.

*When Economists Agree*—This FIM notes that although economists often disagree, there are some statements that they generally agree on. One statement of agreement: Trade restrictions reduce economic welfare. Note that this reflects common value judgements and is not a conclusion from positive economics. See Robert Driskill, “Deconstructing the argument for free trade: a case study of the role of economists in policy debates”, *Economics and Philosophy*, 2012, pp. 1–30.)

## Global Comparison

*Pajama Republics*—Poor countries have low productivity in clothing manufacturing, but even lower productivity in other industries, thus they have a comparative advantage in clothing manufacturing.

## Business Case

*Efficiency, Opportunity Cost, and the Logic of Lean Production at Boeing*—This business case explains the idea behind lean production, with reference to the experiences of Boeing and Toyota.

## Activities

### Creating a Production Possibilities Curve (15–25 minutes)

For this activity you will need two desks, paper (this can be in half-sheets), and two staplers—capital. You will also need four or six volunteers to participate in the activity—labour. Have another student take responsibility for graphing results of the activity on the board. This activity identifies the alternative combinations of output (called widgets and whatsits) that can be produced given the available resources (capital/desks, paper and staplers, and labour/students). That is, the students will generate a production possibilities frontier. Have the nonlabour students draw a production possibilities graph and label the axes. Then have the student grapher draw the graph.

Explain to students that the capital and labour will be used to produce widgets or whatsits. A widget is a piece of paper folded twice into a square and stapled. A whatsit is a piece of paper folded three times. Start by having the students use all their resources to produce widgets for 30 seconds. Count the number of widgets and whatsits produced (whatsits will equal 0). Have the students graph the data point. Next have the students use all their

resources to produce whatsits. Count the production and graph the data point. Finally, have the students divide the resources in half. Have one half produce widgets and the other produce whatsits. Graph this third data point. Connect the points to show the production possibilities frontier.

### Canadian Comparative Advantage (2–3 minutes)

Make a list on the board or overhead with student answers to this question: What comparative advantages does Canada have? You could begin by listing the commodity groupings in the following table. This table shows the trade flows in 2013. The trade balance for each commodity group gives a broad idea of where Canada's comparative advantage lies.

Commodity Grouping	Exports (billions of dollars)	Imports (billions of dollars)	Balance of Trade (billions of dollars)
Farm, fishing, and intermediate food products	27.9	13.1	14.8
Energy products	111.0	44.0	67
Metal ores and non-metallic minerals	17.9	11.5	6.4
Metals and non-metallic mineral products	54.0	40.0	14.0
Basic and industrial chemical, plastic, and rubber products	34.9	40.8	-5.9
Forestry products	33.8	21.0	12.0
Industrial machinery, equipment and parts	26.9	45.4	-18.5
Electronic and electrical equipment and parts	22.6	56.5	-33.9
Motor vehicles and parts	68.2	85.0	-16.8
Aircraft and other transportation equipment and parts	17.4	14.9	2.5
Consumer goods	52.2	97.7	-45.2

(Source: Statistics Canada, Canadian International Merchandise Trade, Cat. 65-001-X, Vol.67, No.12, (December 2013), Tables 1 and 2.)

### Pros and Cons of Trade (3–5 minutes)

Pair students and ask them to brainstorm the pros and cons of the following proposition: "Canada should limit imported textiles from China to create jobs at home." or "Canada should prohibit the importation of products from abroad that are made with child labour."

### Tracing the Circular Flow (5–10 minutes)

Pair students and tell them they will trace the following events through the circular flow: (a) the introduction of a new technology which boosts productivity; (b) the decision of consumers to save more money; and (c) an increase in government spending.

### Simulating the Circular Flow (15–30 minutes)

In a lecture, add banks, government, and exports and imports to the circular flow. Divide the class into the following groups: households, firms, workers, sellers of raw materials, sellers of capital goods, banks, exporters, and importers. Introduce an event into this hypothetical economy: Consumers decide to spend more money and save less. Give this event card to the household group. Have this group write down how it will affect them and pass it on to the next group they feel will be most immediately affected. The next group writes down its impact on them and passes it on. Make sure the event passes to each group. Have one group use the circular-flow diagram to illustrate on the board how the event affected the economy.

**Positive or Normative?** (3–5 minutes)

Read the following sentences to the class, and ask students to label each one as normative or positive:

- “More than 60% of women are in the labour market.” (Positive.)
- “Rent control laws should be implemented because they help to achieve equity or fairness in housing.” (Normative.)
- “Society should take measures to end domestic violence.” (Normative.)
- “People who smoke pass on increased medical costs to the whole society.” (Positive.)
- “Single mothers are more than twice as likely as married mothers to be in poverty.” (Positive.)

**Change It to Normative** (5–10 minutes)

Pair students. Ask one student in each pair to write a positive economic statement of fact, and the other student to rewrite the statement as a normative one. Ask a few pairs to report.

**Appendix*****Creating Student Interest***

Have students discuss the relationship between calories consumed and weight. What is the independent variable? What is the dependent variable?

***Presenting the Material***

Give an example of data and how a graph is set up, then explain how to interpret the graph.

Year	Health Expenditures, as percent of GDP
1975	7.0
1985	8.2
1995	9.2
2005	10.2
2010	11.6
2013 (estimated)	11.2

(Source: Canadian Institute of Health Information, National Health Expenditure Trends 1975–2013, Table A1.)

Ask students the following questions:

1. With health expenditures as a percent of GDP on the vertical axis of a graph and years on the horizontal axis of the graph, plot the data on the graph.
2. Is the line positively or negatively sloped? (It is positively sloped; as the years have increased, the percent share of GDP has increased.)
3. Is it a linear function? (No, the line is not a straight line.)
4. What does the graph not tell us? (It does not indicate what is causing the change in health expenditures as a percent of GDP.)

***Common Student Pitfalls***

Students forget the basic setup of a graph: that each point on the graph refers to a specific quantity on the vertical axis and horizontal axis. Use a demand curve to illustrate: point A on the demand curve means that at a price of \$1.00, consumers will buy 200 of the good, for example. You may want to point out which axis on the graph is referred to as the vertical axis and which is the horizontal axis.

## ***Activity***

### **Causal Relationships (5–10 minutes)**

Ask students to think of some causal relationships between health expenditures and other variables. Identify the variables that may increase or decrease health expenditures. What is the dependent variable? (Health expenditures.) What independent variables can influence total health spending as a percent of the GDP? (Some possibilities: percentage of the population over age 65, extent of patent protection given to drug companies, percentage of the population who are smokers, percentage of the population who are overweight, structure and incentives in the health care system, and so on.)



SECOND CANADIAN  
EDITION

# MACROECONOMICS

Paul Krugman | Robin Wells

Iris Au | Jack Parkinson

2

SECOND CANADIAN EDITION

## MACROECONOMICS

Krugman ■ Wells ■ Au ■ Parkinson

## Chapter 2

Economic Models: Trade-offs  
and Trades

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## WHAT YOU WILL LEARN IN THIS CHAPTER

- Why models? Simplified representations of reality—play a crucial role in economics
- Two simple but important models:
  - production possibility frontier
  - comparative advantage
- Circular-flow diagram—a schematic representation of the economy
- The difference between positive economics and 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. How? By
  - Creating a real but simplified economy  
Example: cigarettes in World War II prison camps
  - Simulating an economy on a computer  
Examples: tax models, money models...
- The “**other things equal**” **assumption** means that all other relevant factors remain unchanged.

# FOR INQUIRING MINDS

## Model That Ate The Economy

- “The model that ate the economy” originated in finance theory, the branch of economics that seeks to understand what assets such as stocks and bonds are worth.
- Finance theory has become increasingly important as Wall Street has shifted from trading simple assets (e.g., stocks and bonds) to more complex assets—notably, mortgage-backed securities (or MBSs for short).
  - An MBS is an asset that entitles its owner to a stream of earnings based on the payments made by thousands of people on their home loans. Investors wanted to know how risky these complex assets were.

# FOR INQUIRING MINDS

## Model That Ate The Economy

- In 2000, a Wall Street financial theorist announced that he had solved the problem by employing a huge statistical abstraction—assuming that current homeowners were no more likely to stop paying their mortgages than in previous decades.
- With this assumption, he devised a simple model for estimating the risk of buying an MBS.
  - Financial traders loved the model as it opened up a huge and extraordinarily profitable market for them.
  - Using this simple model, Wall Street was able to create and sell billions of MBSs, generating billions in profits for itself.

# FOR INQUIRING MINDS

## Model That Ate The Economy

- Darrell Duffie, a Stanford University finance professor, warned from the sidelines that the estimates of risk calculated by this simple model were just plain wrong.
  - Duffie and other critics said that in the search for simplicity, the model seriously underestimated the likelihood that many homeowners would stop paying their mortgages at the same time, leaving MBS investors in danger of incurring huge losses.

# FOR INQUIRING MINDS

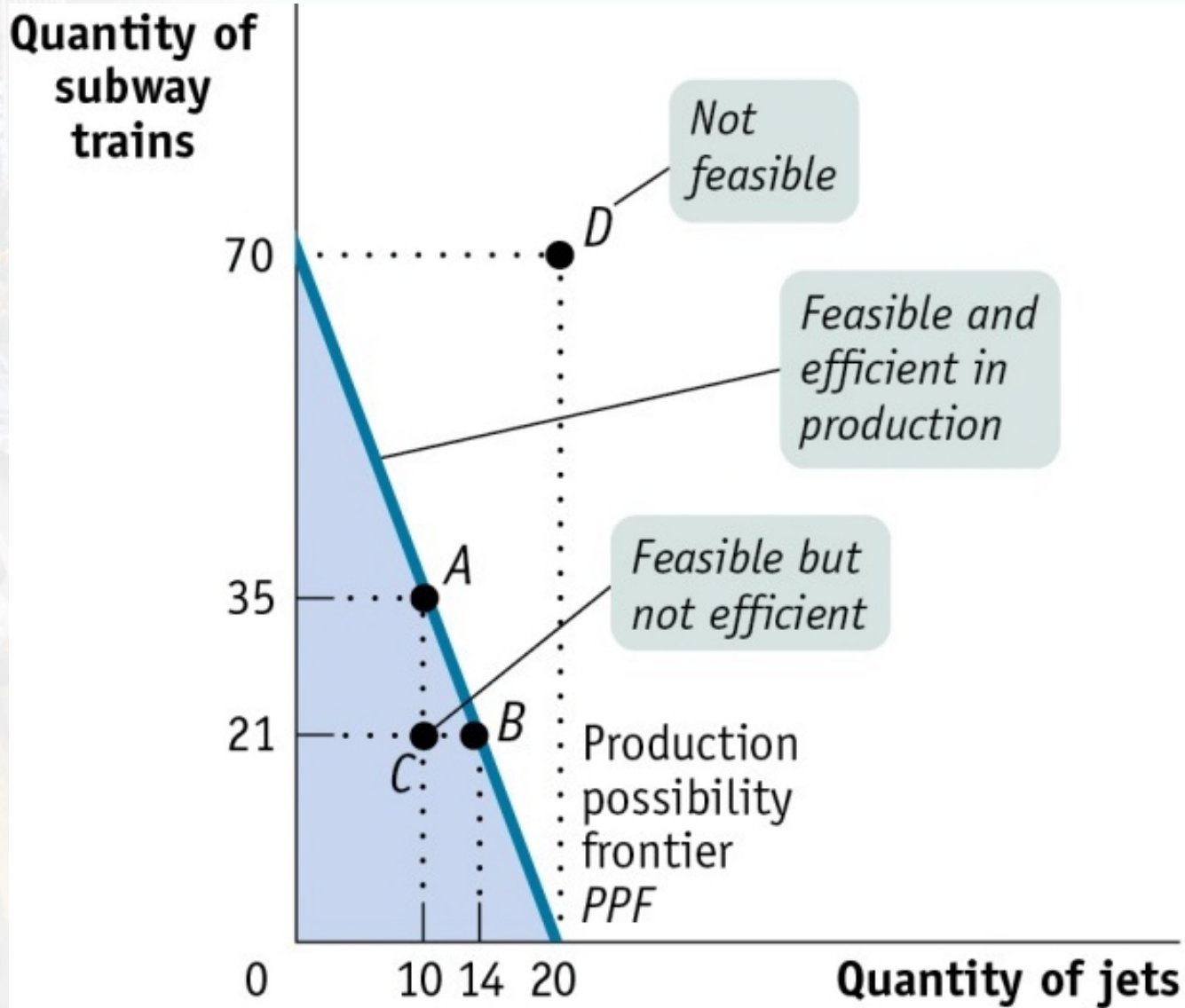
## Model That Ate The Economy

- The warnings fell on deaf ears—no doubt because Wall Street was making so much money.
  - Billions of dollars worth of MBSs were sold to investors both in the United States and abroad.
- In 2008–2009, the problems critics warned about appeared in catastrophic fashion.

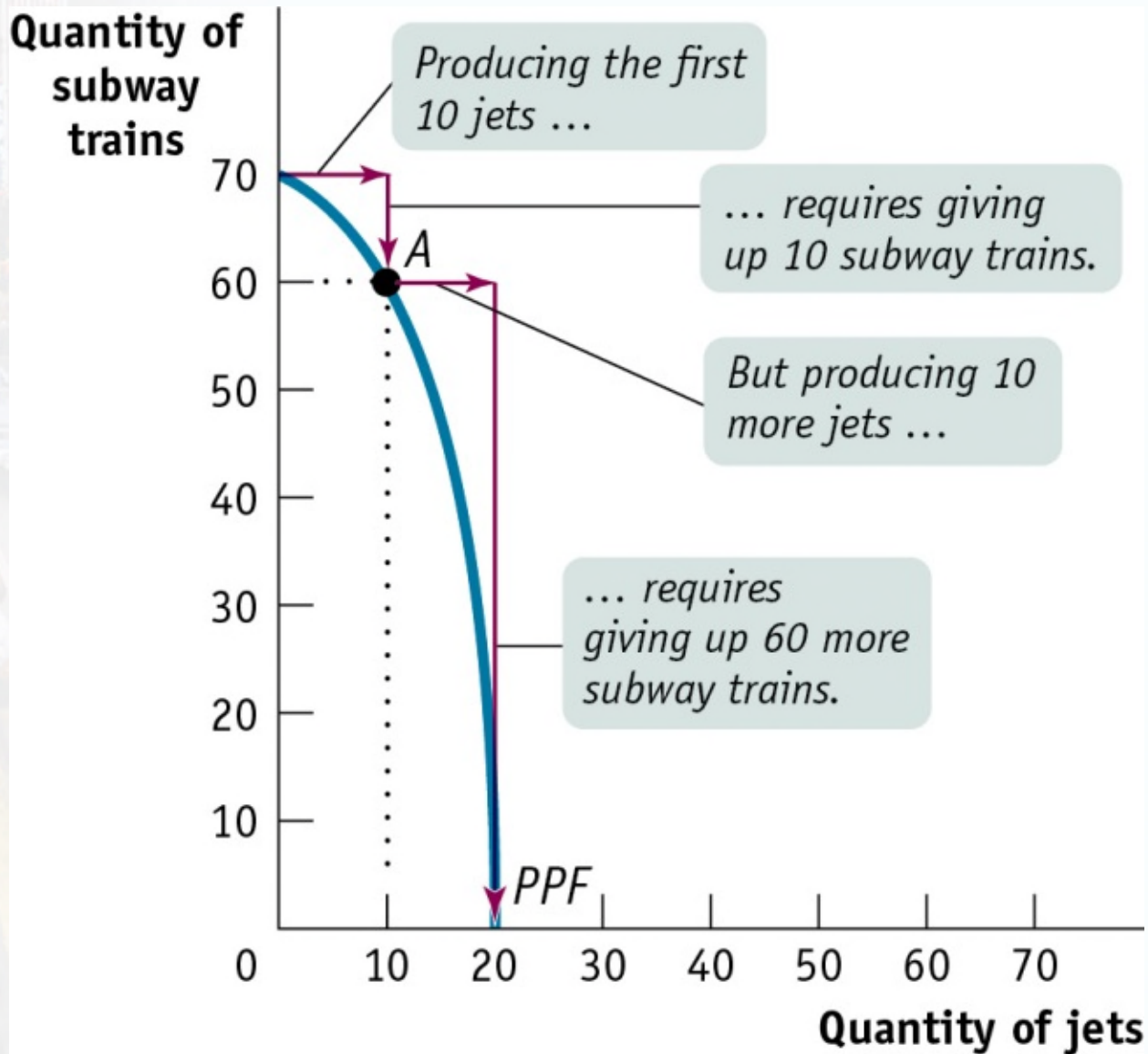
# Trade-offs: The Production Possibility Frontier

- 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 good.
- The PPF improves our understanding of trade-offs by considering a simplified economy that produces only two goods by showing this trade-off graphically.

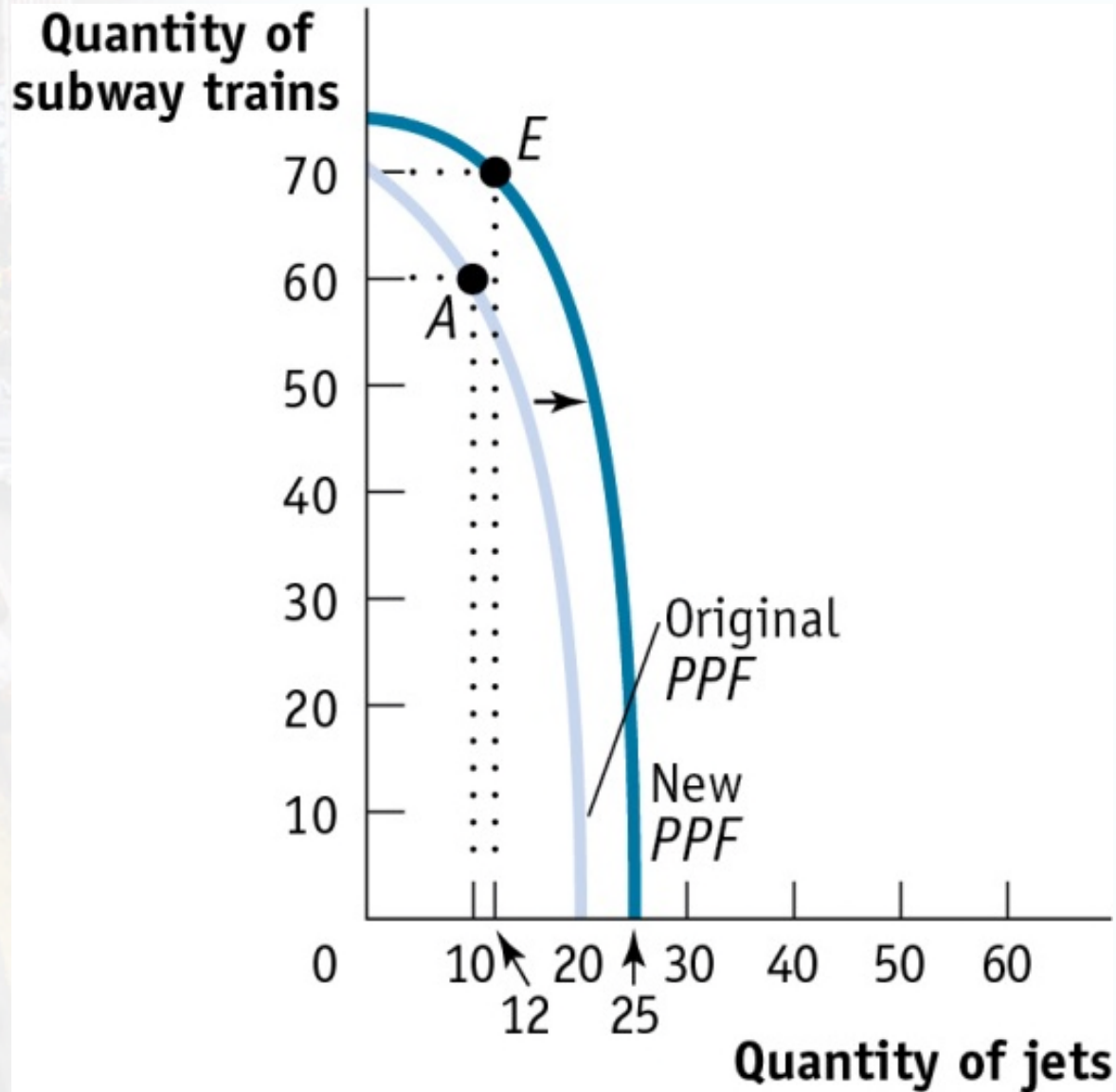
# The Production Possibility Frontier



# Increasing Opportunity Cost

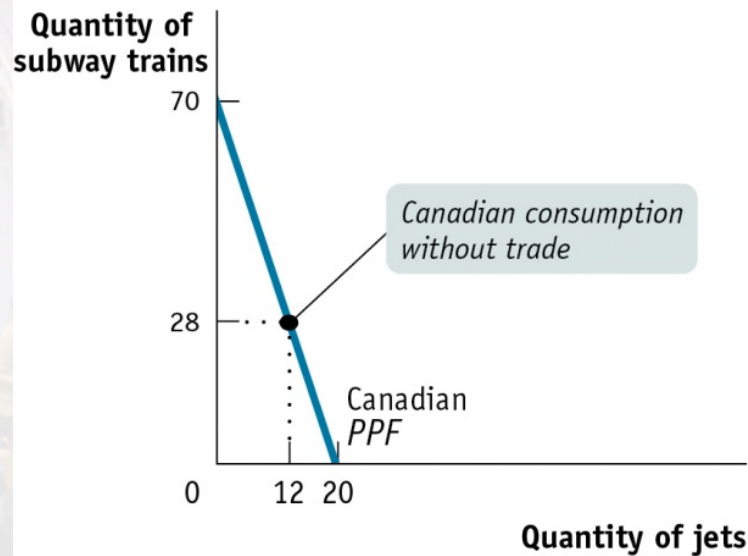


# Economic Growth

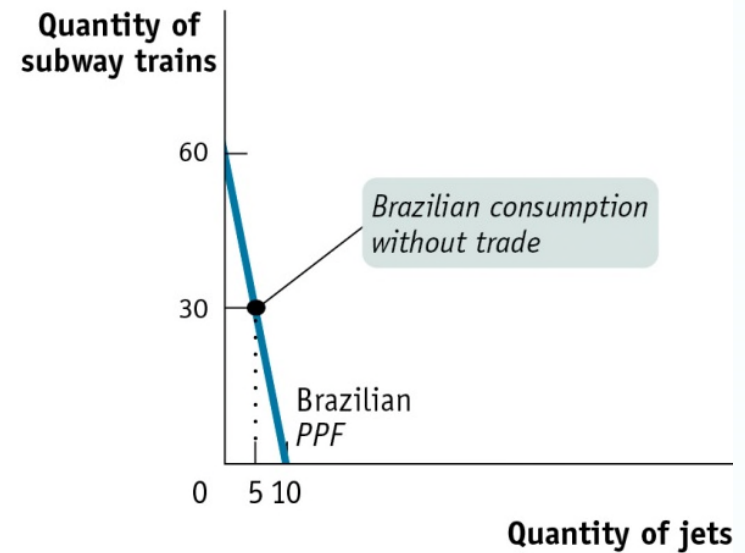


# Production Possibilities for Two Countries

(a) Canadian Production Possibilities



(b) Brazilian Production Possibilities



# Canadian and Brazilian Opportunity Costs

	<b>Canadian Opportunity Cost</b>		<b>Brazilian Opportunity Cost</b>
<b>One subway train</b>	<b><math>2/7</math> jet</b>	<b><math>&gt;</math></b>	<b><math>1/6</math> jet</b>
<b>One jet</b>	<b><math>7/2</math> subway trains</b>	<b><math>&lt;</math></b>	<b>6 subway trains</b>

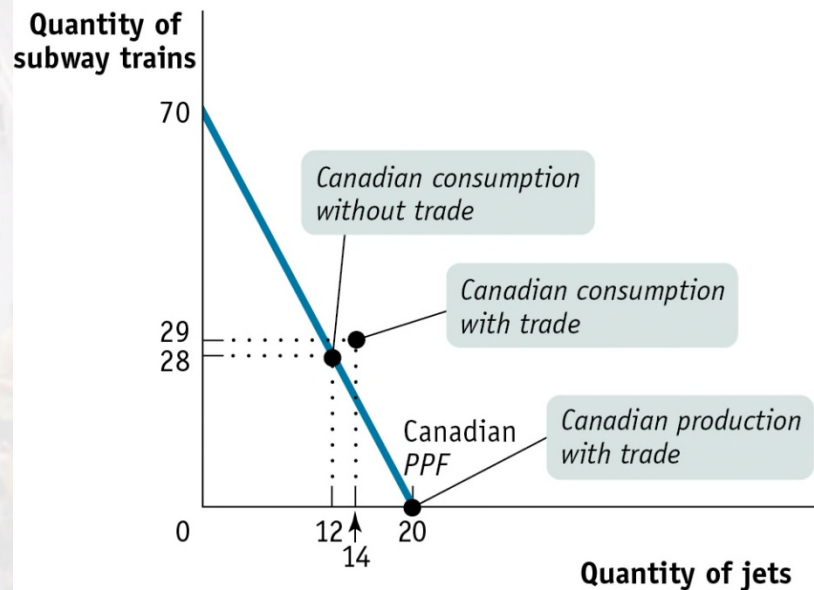


# Specialize and Trade

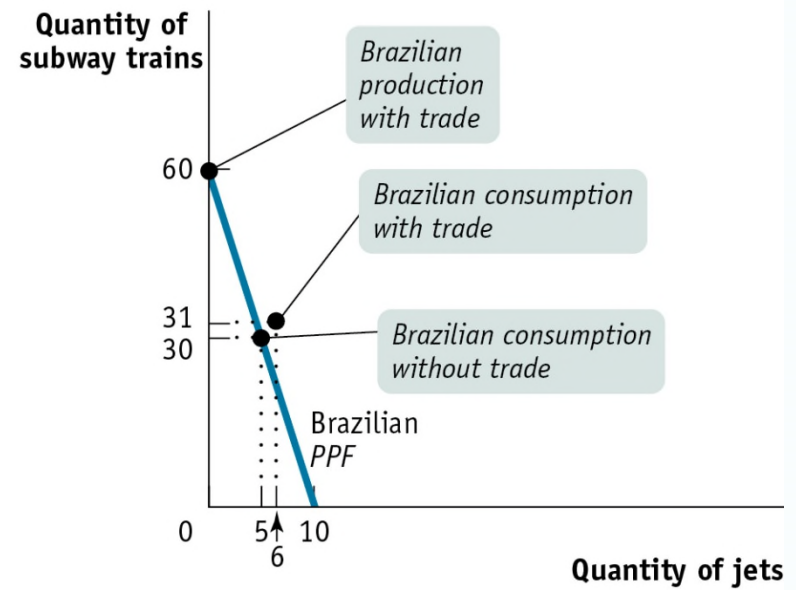
- Both countries are better off when they each specialize in what they are good at and then trade.
- It's a good idea for Brazil to make subway trains for both of them, because its opportunity cost of a subway train in terms of jet not made is only  $1/6$  of a jet, versus  $2/7$  subway trains for Canada.
- Correspondingly, it's a good idea for Canada to make jets for both of them.

# Comparative Advantage and Gains from Trade

(a) Canadian Production and Consumption



(b) Brazilian Production and Consumption



# How the Two Countries Gain from Trade

TABLE 2-2 How Canada and Brazil Gain from Trade

		<u>Without Trade</u>		<u>With Trade</u>		<b>Gains from Trade</b>
		Production	Consumption	Production	Consumption	
Canada	Subway trains	28	28	0	29	+1
	Jets	12	12	20	14	+2
Brazil	Subway trains	30	30	60	31	+1
	Jets	5	5	0	6	+1

Both Canada and Brazil experience gains from trade:

- Canadian consumption of jets increases by two, and its consumption of subway trains increases by one.
- Brazilian consumption of jets increases by one, and its consumption of subway trains increases by one.



# Comparative vs. Absolute Advantage

- An individual has a comparative advantage in producing a good or service if the opportunity cost of producing the good is lower for that individual than for other people.
- An individual has an absolute advantage in an activity if he or she can do it better than other people. Having an absolute advantage is not the same thing as having a comparative advantage.

# Canada vs. Brazil – Absolute vs. Comparative

- Even when Canada has an **absolute advantage** in both activities: it can produce more output with a given amount of input (in this case, its time) than Brazil.
- But we've just seen that Canada can indeed benefit from a deal with Brazil because *comparative*, not *absolute*, advantage is the basis for mutual gain.

# Canada vs. Brazil – Absolute vs. Comparative

- So Brazil, despite its absolute disadvantage, even in subway trains, has a comparative advantage in subway train making.
- Meanwhile Canada, which can use its time better by making subway trains, has a comparative *disadvantage* in subway train making.

# PITFALLS

## Misunderstanding Comparative Advantage

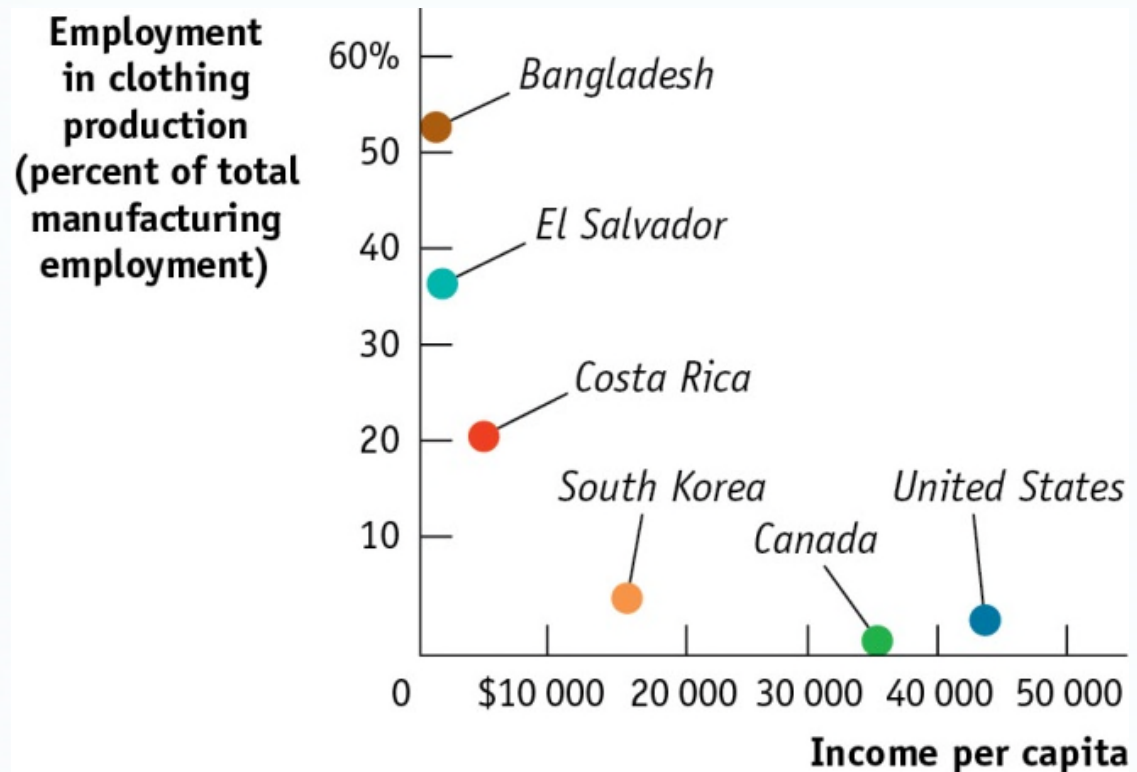
A common mistake is to confuse comparative advantage with absolute advantage.

Example: North America vs. Japan in 1980s:

- Commentators: *“North America might soon have no comparative advantage in anything.”*
- Wrong! They meant *“absolute advantage.”*

# Global Comparison: Pajama Republics

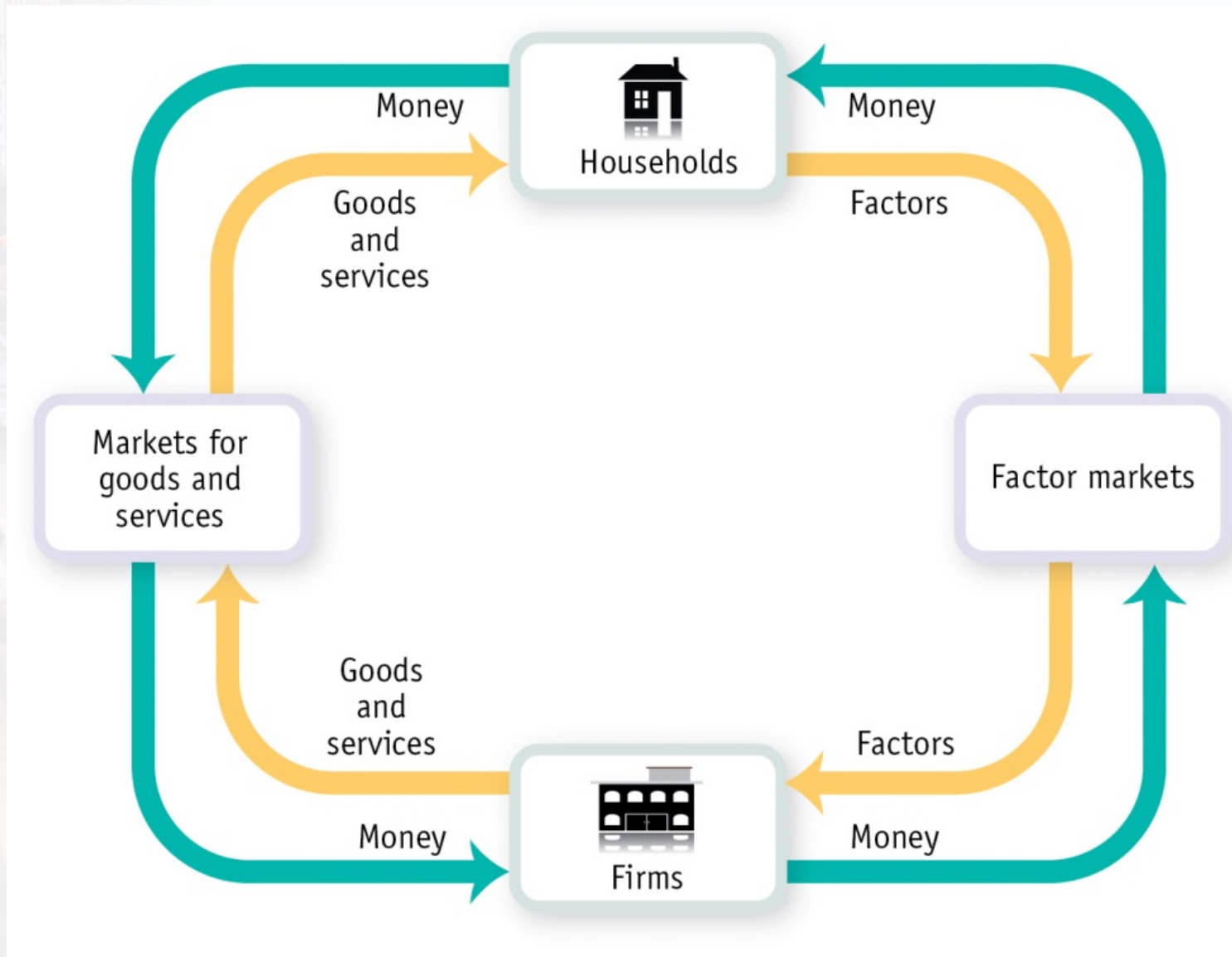
- Poor countries have relatively large clothing industries, while rich countries have relatively small ones.
- Poor countries have low productivity in the clothing sector, but the sector has higher comparative advantage because their productivity in nonclothing sectors is even lower.



# Transactions: The Circular-Flow Diagram

- Trade takes the form of barter when people directly exchange goods or services they have for goods or services they want.
- The circular-flow diagram is a model that represents the transactions in an economy by flows around a circle.

# The Circular-Flow Diagram





# Circular-Flow of Economic Activities

- A **household** is a person or a group of people that share their income.
- A **firm** is an organization that produces goods and services for sale.
- Firms sell goods and services that they produce to households in **markets for goods and services**.
- Firms buy the resources they need to produce goods and services—**factors of production**—in **factor markets**.

# Circular-Flow of Economic Activities

- Ultimately, factor markets determine the economy's income distribution — how total income is divided among the owners of the various factors of production.





# ECONOMICS IN ACTION

## Rich Nation, Poor Nation

- Why are some countries so much poorer than we are?
- The immediate reason is that their economies are much less productive.
  - Firms in these countries are just not able to produce as much from a given quantity of resources.
- But if the economies of these countries are so much less productive than ours, how is it that they make so much of our clothing? Why don't we do it for ourselves?



# ECONOMICS IN ACTION

## Rich Nation, Poor Nation

- The answer is *comparative advantage*.
  - Just about every industry in Bangladesh is much less productive than the corresponding industry in Canada. But the productivity difference between rich and poor countries varies across goods; the difference is very large in the production of sophisticated goods like aircraft, but smaller in the production of simpler goods like clothing.



# Using Models

- **Positive economics** is the branch of economic analysis that describes the way the economy actually works.
- **Normative economics** makes prescriptions about the way the economy *should* work.
- A **forecast** is a simple prediction of the future.

# Using Models

- Economists can determine correct answers for positive questions, but typically not for normative questions, which involve value judgments.
- The exceptions are when policies designed to achieve a certain prescription can be clearly ranked in terms of efficiency.

# When and Why Economists Disagree

There are two main reasons economists disagree:

1. Which simplifications to make in a model
2. Values

# FOR INQUIRING MINDS

## When Economists Agree

- Do economists really disagree so much?
  - Not according to a classic survey of members of the American Economic Association, reported in the May 1992 issue of the *American Economic Review*.
- So is the stereotype of quarreling economists a myth?
  - Not entirely: economists do disagree quite a lot on some issues, especially in macroeconomics. But there is a large area of common ground.

# ECONOMICS IN ACTION

## Economists Beyond the Ivory Tower

- One specific branch of economics, finance theory, plays an important role on Bay Street—not always to good effect. But pricing assets is by no means the only useful function economists serve in the business world.



# ECONOMICS IN ACTION

## Economists Beyond the Ivory Tower

- Businesses need forecasts of the future demand for their products, predictions of future raw-material prices, assessments of their future financing needs, and more—economic analysis is essential for these.
  - Top financial institutions like Royal Bank and National Bank maintain high-quality economics groups that produce analyses of forces and events likely to affect financial markets.
  - Other economists are employed by consulting firms like, which sells analysis and advice to a wide range of other businesses.

# ECONOMICS IN ACTION

## Economists Beyond the Ivory Tower

- Last but not least, economists work in almost every branch of the Canadian government. The strongest concentration of economists is likely to be found in the Department of Finance (plans and prepares the federal government's budget) and the Bank of Canada (designs and implements monetary policy).

# ECONOMICS IN ACTION

## Economists Beyond the Ivory Tower

- Economists play an especially important role in two international organizations headquartered in Washington, D.C.
  1. The International Monetary Fund, which provides advice and loans to countries experiencing economic difficulties
  2. The World Bank, which provides advice and loans to promote long-term economic development

# SUMMARY

1. Almost all economics is based on **models**.

An important assumption in economic models is the **other things equal assumption**, which allows analysis of the effect of a change in one factor by holding all other relevant factors unchanged.

# SUMMARY

2. One important economic model is the **production possibility frontier**. It illustrates: *opportunity cost*, *efficiency*, and *economic growth*.

There are two basic sources of growth: an increase in **factors of production** — resources such as land, labor, capital, and human capital, inputs that are not used up in production — and improved **technology**.

# SUMMARY

3. Another important model is **comparative advantage**, which explains the source of gains from trade between individuals and countries. Everyone has a comparative advantage in something.

This is often confused with **absolute advantage**, an ability to produce a particular good or service better than anyone else.

# SUMMARY

4. In the simplest economies, people **barter** or trade goods and services for one another—rather than trade them for money, as in a modern economy.

The **circular-flow diagram** represents transactions within the economy as flows of goods, services, and money between **households** and **firms**. These transactions occur in **markets for goods and services** and **factor markets**.

# SUMMARY

5. Economists use economic models both for **positive economics**, which describes how the economy works, and for **normative economics**, which prescribes how the economy *should* work.

Positive economics often involves making **forecasts**. Economists can determine correct answers for positive questions, but typically not for normative questions, which involve value judgments.

# SUMMARY

5. There are two main reasons economists disagree.

One: they may disagree about which simplifications to make in a model.

Two: economists may disagree—like everyone else—about values.

# KEY TERMS

## KEY TERM



- Model
- Other things equal assumption
- Production possibility frontier
- Factors of production
- Technology
- Comparative advantage
- Absolute advantage
- Barter
- Circular-flow diagram
- Household
- Firm
- Markets for goods and services
- Factor markets
- Income distribution
- Positive economics
- Normative economics
- Forecast
- Specialization
- Equilibrium
- Efficient
- Equity