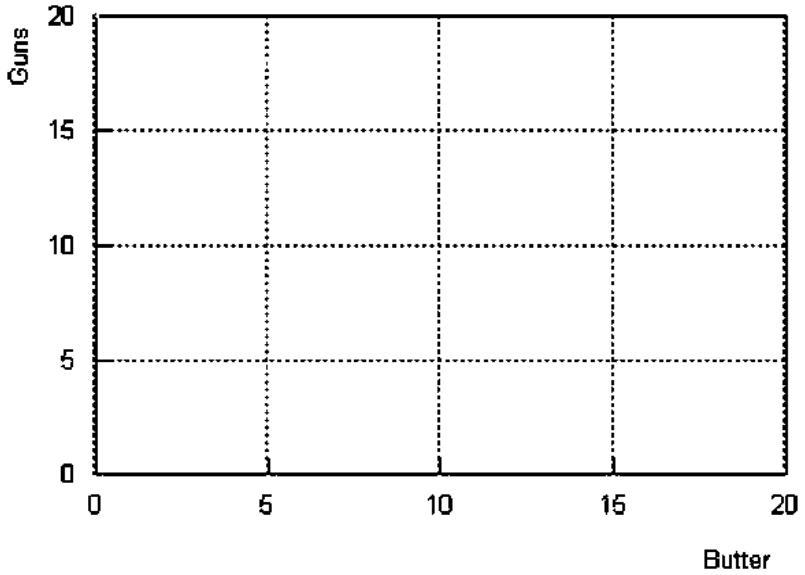
Chapter 2, The Production Possibility Model, Trade and Globalization

Essay Questions

1. The table below is a production possibility table for the fictional country of Myopia. Use it to construct the corresponding production possibility curve in the quadrant below. (Label the axes.)



Guns	Butter
0	20
5	15
10	14
15	8
20	0

(a) Explain the meaning of a production possibilities curve.

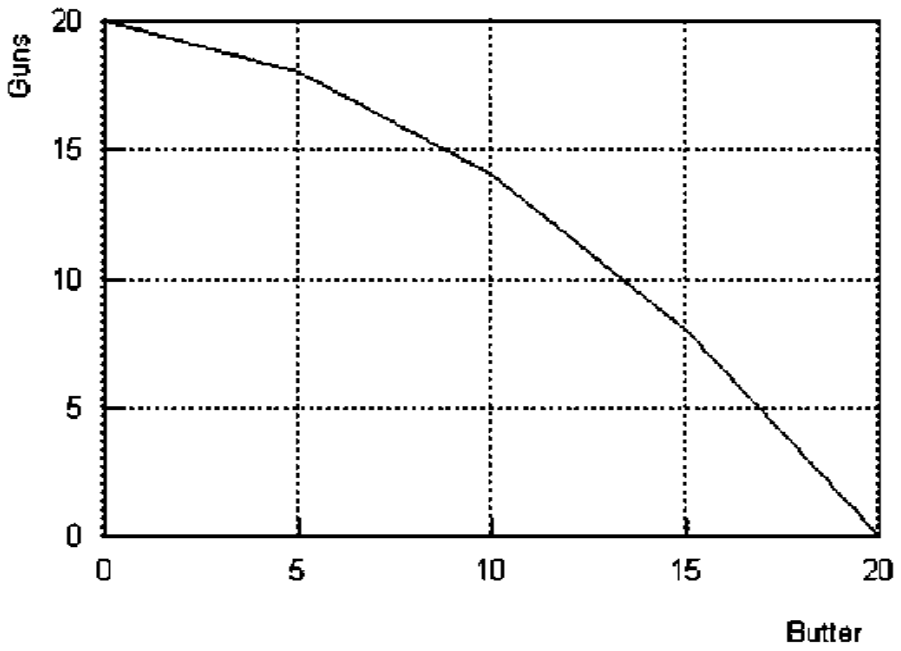
(b) What is assumed to be constant when we draw that curve?

(c) How is a point on the curve different from (1) a point inside the curve or (2) a point outside the curve?

(d) How does this curve illustrate the concept of opportunity cost?

(e) How does it illustrate the principle of increasing marginal opportunity cost?

Answer:



(a) A production possibilities curve is a curve measuring the maximum combination of outputs that can be obtained from a given number of inputs - using a given technology.
(b) When we draw the production possibility curve, the amount of inputs and the state of technology are assumed to be fixed
(c) A point on the production possibility curve is efficient because it corresponds to the maximum amount of butter for any given amount of guns. (1) A point inside the production possibility curve is inefficient because for any given amount of guns, it would be possible to produce more butter. (2) Any point that lies outside the curve is simply not attainable given the available resources and technology.
(d) The negative slope of the curve illustrates the notion of opportunity cost. In order to get more butter, it is necessary to give up some guns. The amount of guns given up is the opportunity cost of the additional units of butter.
(e) The increasing slope of the production possibility curve illustrates the principle of increasing marginal opportunity cost. Thus the cost of the first five units of guns is only two units of butter; but the cost of the last five units of guns is eight units of butter.

2. In what way does the notion of comparative advantage help to explain that production possibility curves are bowed outward (the principle of increasing opportunity cost)? Explain your answer in the context of the tradeoff between guns and butter.

Answer:
Some resources are more efficient in producing one product rather than another. Metalworkers would be more efficient in producing guns and farmers would be more efficient in producing butter. When the economy produces only guns, it uses both metalworkers and farmers to do so. When the economy starts to produce some butter, it first takes the farmers out of the armaments industry because removing them has a low opportunity cost in terms of guns. (The farmers have a comparative advantage in producing butter.) However, after all the farmers have left the

armaments industry, further production of butter will require that metalworkers be shifted into farming with large losses in guns and only small gains in butter. (The metal workers had a comparative advantage in producing guns.) Thus the opportunity cost of additional butter, which was very small at the beginning, becomes steadily larger as the nation begins to specialize in producing butter.

3. Most advanced nations have both agricultural sectors and armaments industries. They do not completely specialize in one industry or the other; but generally produce some of both commodities.

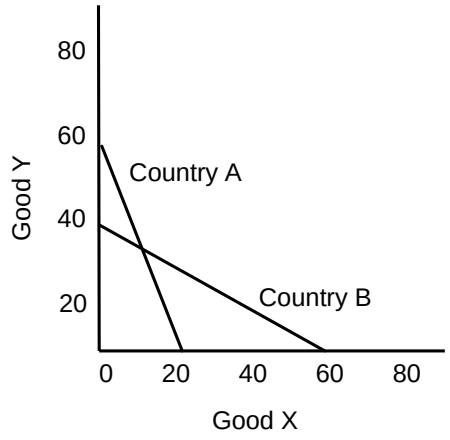
(a) State the principle of increasing marginal opportunity cost.

(b) Is this incomplete specialization consistent with the principle of increasing opportunity costs? Explain your answer in the context of the tradeoff between guns and butter.

Answer:
(a) The principle of increasing marginal opportunity cost states that in order to get more of something, one must give up ever-increasing quantities of something else.
(b) The fact that nations do not specialize completely but produce a variety of products is consistent with the principle of increasing opportunity costs. Most advanced countries have some resources that have a comparative advantage in producing guns and some resources that have a comparative advantage in producing butter. As a result, the production possibility curve between the two is bowed outward, thus illustrating the principle of increasing marginal opportunity costs. Under these circumstances, complete specialization would be inefficient. It would be more efficient to employ each type of resource in the industry in which it has a comparative advantage.

4. Assume that Belgium and Pakistan have linear production possibilities curves as shown in the graph below. Explain how they can both consume a combination of textiles and chocolate that lies outside their individual production possibility curves.

Answer:



When nations do not trade, their production possibility curves are also their consumption possibility curves. But if they specialize in the product in which their resources have a comparative advantage (e.g. Good Y in the case of Country A and Good W in the case of Country B). If they specialize and produce only that good for which each has a comparative advantage, Country A will produce 60 units of Good Y and Country B will produce 60 of Good X. If they divide the total output equally, each will be able to consume 30 of each good, a combination outside each country's individual production possibility curves. This is because each has specialized in the product in which it had a comparative advantage.

5. What is the "law of one price"? Explain how outsourcing is part of a global process guided by the law of one price.

Answer:
The law of one price states that the wages of workers in one country will not differ significantly from workers of equal skill in institutionally similar countries.

Outsourcing frightens many American workers because wages in developing countries are much lower than those in the United States. Some fear that the United States will not have a comparative advantage in anything. But that is not possible. The United States will have a comparative advantage in innovative goods that pay higher wages. But in time, foreign nations will catch up technologically.

According to the law of one price, the U.S wage premium will have to decline in order to regain its comparative advantage. This has begun to happen over the last twenty years as U.S. manufacturing wages have remained constant while foreign wages have risen significantly. This can be expected to continue, and is not a happy prospect for American workers. If, however, the United States tries to prevent outsourcing with trade restrictions, U.S. based companies will find that they cannot compete internationally.

Short Answer Questions

6. What does a production possibilities table demonstrate?

Answer:
A production possibilities table is a table that demonstrates a choice's opportunity costs by summarizing (using numbers) what alternative outputs you can achieve with your inputs.

7. What is a production possibilities curve?

Answer:
A production possibilities curve is a curve that shows the maximum combination of outputs that can be obtained from a given number of inputs.

8. What two lessons can you learn from a production possibilities curve?

Answer:

The two lessons you can learn from a production possibilities curve are:
(a) There is a limit to what you can achieve, given the existing institutions, resources and technology.
(b) Every choice you make has an opportunity cost. You can get more of something only by giving up something else.

9. What does it mean when we say that a country has comparative advantage in a specific good?

Answer:
A country has a comparative advantage in a good if it can produce that good at a lower opportunity cost than another country can.

10. Can a country gain comparative advantage in some product? Can a country lose that advantage?

Answer:
The answer is yes, in both cases. The availability of factors of production and the technology used to produce goods and services determine the relative cost of production of a good and, thus, can give, or take, a comparative advantage in that product to, or from, a country. An example of comparative advantage gained is the growth of the automobile industry in Japan. Examples of comparative advantage lost are the decline of textile and television manufacturing in the U.S.

11. What is the principle of increasing marginal opportunity cost?

Answer:
The principle of increasing marginal opportunity cost states that in order to get more of something, one must give up ever-increasing quantities of something else.

12. Why do marginal opportunity costs increase as you produce more of a specific good?

Answer:
Marginal opportunity costs increase because not all resources are equally well suited for use in the production of all goods. For example, wood is a better resource for the production of pianos than of cars. In the production of any specific good, as the most suitable resources get used up and less suitable resources are used, the opportunity cost increases.

13. Under what assumption(s) is the production possibilities curve a representation of efficiency points?

Answer:
Points of a PPC are efficient points under the assumption that more is better, which allows us to state that efficiency equals productive efficiency.

14. Does the production possibilities curve tell us if goods are distributed efficiently in a society? Explain.

Answer:
No. The production possibilities curve only show productive efficiency—the production of the most amount of output with a given amount of resources. The production possibilities curve does not answer the questions of who gets what or what the society should produce.

15. What is the argument for laissez faire policy in the context of benefits from trade?

Answer:
When the market coordinates the actions of individuals, all parties benefit from trade. Individuals use their comparative advantage and produce the goods that they bring to the market for trading. Market competition ensures that individuals get the best bargain available in the market and, thus, everybody benefits.

Problems and Applications

16. Consider a farmer's production possibilities curve, with corn measured on the vertical axis, and soybeans on the horizontal axis. Describe the impact of each of the following on the curve:

(a) The farmer buys or rents more land.

(b) A higher yielding variety of corn seed is developed.

(c) A hailstorm wipes out half of whatever crops the farmer has planted

(d) The government raises price supports for soybeans.

Answer:
(a) The entire curve should shift out, since more land could presumably be used to grow either crop.
(b) The vertical intercept will shift up, as greater amounts of corn can now be grown, but the amount of potential soybean crop remains unchanged.
(c) The entire curve will shift in towards the origin, though not necessarily by one-half, since the farmer may be able to work the surviving crops more intensively and thus suffer a loss in output of less than 50 percent.
(d) No effect, since it has changed neither the amount of inputs available nor the technology. If one wishes to argue that the increased price supports change the existing institutions, namely they provide farmers with greater incentives to grow soybeans. Then the curve would shift further out along the horizontal axis, with no change in the vertical intercept.

17. Draw a production possibilities curve that indicates how you might divide up 10 hours of study time between your economics and accounting midterm exams. Put expected grade in economics on the horizontal axis and expected grade in accounting on the vertical axis. If you don't study at all, you expect to make a 70 on both exams. For every one additional

hour of studying economics, your exam grade rises by 3 points. The same is true for accounting.

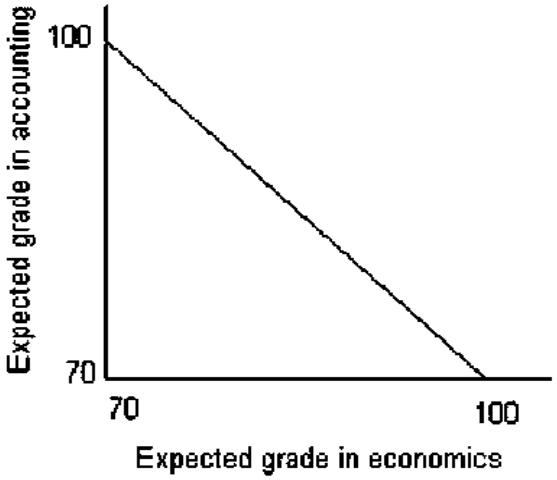
a. What is the opportunity cost of studying one extra hour for your economics exam?

b. What is the opportunity cost of studying one extra hour for your accounting exam?

c. Can the production possibility curve shift? Explain.

Answer:

The diagram below

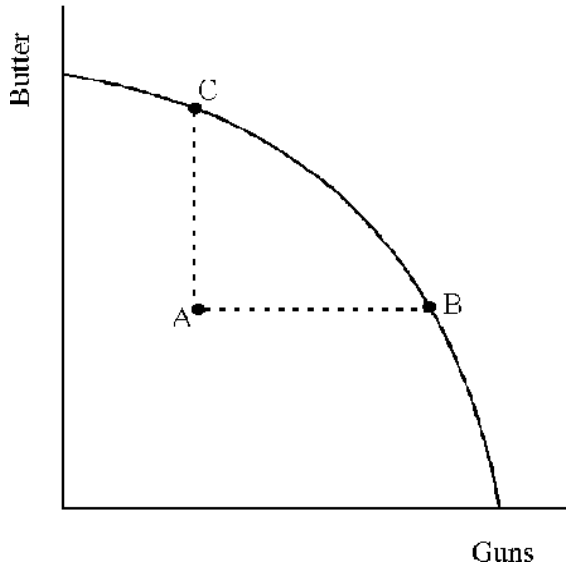


If you allocate all available studying time for economics, you will make a 100 on the test (70 + 3 times 10). Similarly, if you don't study economics and allocate all your time to accounting, you will make a 100 on the accounting exam. Therefore, the shape of the production possibilities curve is as shown above.
(a) The opportunity cost of one hour of studying economics is one hour of studying accounting, which means the loss of 3 points on the accounting exam.
(b) The opportunity cost of one hour of studying accounting is one hour of studying economics, which means the loss of 3 points on the economics exam.
(c) Yes, the production possibilities curve may shift. If you allocate more time to studying or if you developed a method that would make your studying time more productive, the curve will shift in such a way that it might be possible to get 100 in both courses. In this case, it would not be a parallel shift.

18. What is productive efficiency? Illustrate it with a production possibilities curve.

Answer:

Productive efficiency means achieving as much output as possible from a given amount of inputs or resources. This can be illustrated using a production possibilities curve by comparing points under the curve with points on the curve. Consider the diagram below that shows the PPC trade-off between guns and butter.



Compare points B and C with point A. Point A is an inefficient combination since the same resources can be used to get more guns without giving up any butter (point B) or more butter without giving up any guns (point C). Points B and C represent efficient production points.

19. Below is the production possibilities table for the country of Lavaland.

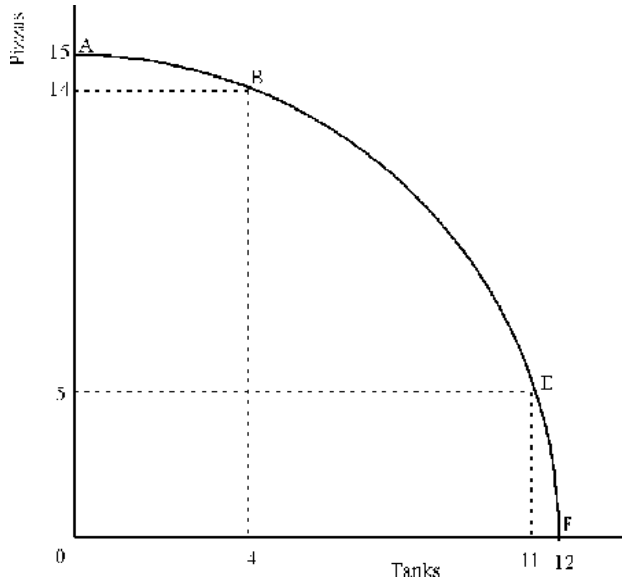
% resources devoted to production of tanks	Number of tanks	% resources devoted to production of pizza	Number of pizzas	Row
0	0	100	15	A
20	4	80	14	B
40	7	60	12	C
60	9	40	9	D
80	11	20	5	E
100	12	0	0	F

(a) Use the information in the table to draw the production possibilities curve (PPC) for Lavaland. Put tanks on the horizontal axis.

(b) What is the cost to Lavaland of moving from point A to point B on its PPC? And of moving from point E to point F?

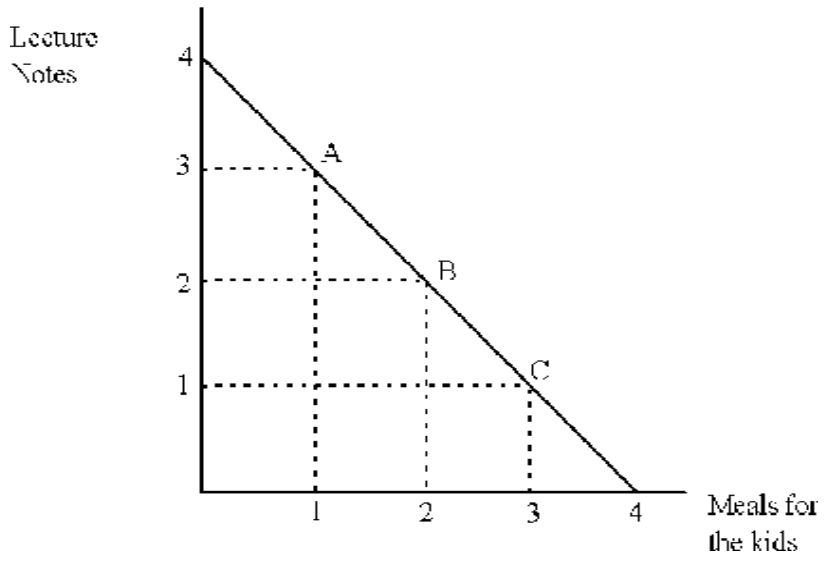
(c) What general economic principle is being illustrated by your answers to part (b) above? Explain.

Answer:
(a) The diagram should look like this:



(b) The opportunity cost of moving from point A to point B is 1 pizza. The cost of moving from point E to point F is 5 pizzas.
(c) In moving from A to B, Lavaland gained 4 tanks. In moving from E to F, Lavaland gained 1 tank. But the cost of attaining one tank was much more with the movement from E to F than it was with the movement from A to B. In moving from A to B each tank required giving up of an average of 1/4 of a pizza, whereas moving from E to F one tank required giving up 5 pizzas. The increasing cost of another tank (in terms of pizzas foregone) as Lavaland moved from A to F illustrates the principle of increasing marginal opportunity cost.

20. Below is a picture of a production possibilities curve that shows two products Professor Colander (your textbook author) might produce during any given day.

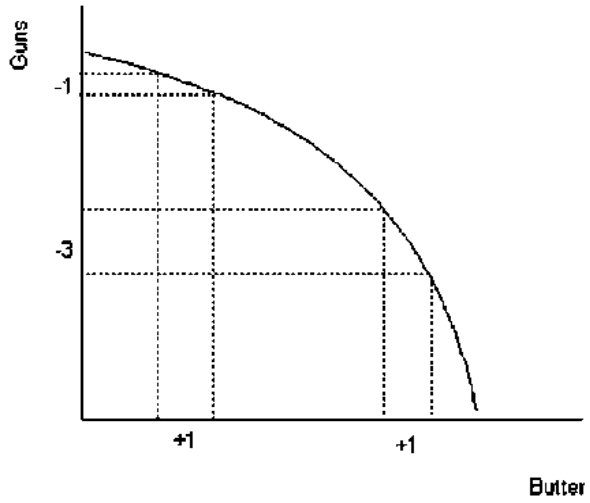


Does this PPC illustrate the principle of increasing marginal opportunity cost? Explain.

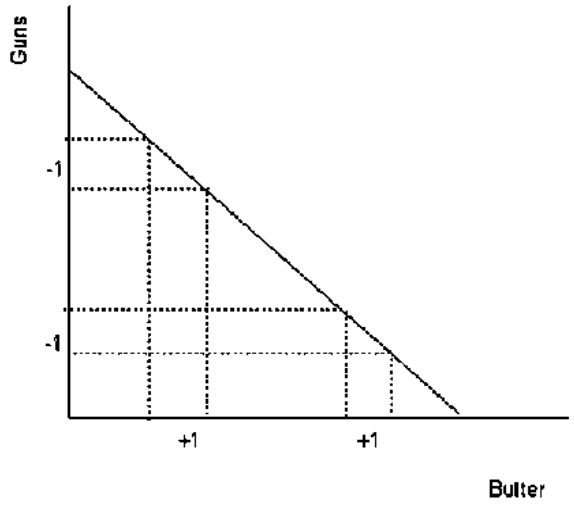
Answer:
This PPC does not illustrate the principle of increasing marginal opportunity cost. To see why not, think about moving along the PPC from points A to B and then from points B to C. For a movement from A to B, the opportunity cost of notes is 1 lecture. For a movement from B to C, the opportunity cost of notes is also 1 lecture. Thus this PPC illustrates a constant opportunity cost. This example demonstrates that the nature (or type) of opportunity cost is directly related to the shape of the PPC.

21. Using production possibilities curves, demonstrate increasing marginal opportunity cost and constant marginal opportunity cost.

Answer:
Examine the diagram below. On Graph A, as we produce more and more butter, the opportunity cost of guns rises. The graph shows that at low range of butter production, the opportunity cost of one extra unit of butter is one gun. At high butter production, the opportunity cost of a unit of butter is 3 guns. On graph B, the opportunity cost is constant. Specifically, the opportunity cost of one unit of butter is always one gun, no matter how much butter we are producing.



Graph A



Graph B

22. The Bahamas and India produce both pineapple and rice (both measured in tons). The table below illustrates their production possibilities.

The Bahamas		India	
Rice	Pineapple	Rice	Pineapple
0	100	0	50
5	90	5	47.5
10	80	10	45
15	70	15	42.5
20	60	20	40
25	50	25	37.5
50	0	100	0

(a) In the Bahamas, what is the opportunity cost of a ton of pineapples, and of a ton of rice?

(b) In India, what is the opportunity cost of a ton of pineapple, and of a ton of rice?

(c) Which country has a comparative advantage in the production of pineapple?

(d) Show how if each country specialized in that good for which it has a comparative advantage and split the resulting production, each would be able to consume more than if they did not trade.

Answer:
(a) In the Bahamas, the opportunity cost of producing 5 more tons of rice is 10 tons of pineapple. Thus, the opportunity cost of producing 1 ton of rice is 2 tons of pineapple. The opportunity cost of producing one ton of pineapple is, therefore, 0.5 tons of rice.

(b) In India, the opportunity cost of producing 5 more tons of rice is 2.5 tons of pineapple. Thus, the opportunity cost of producing 1 ton of rice is 0.5 tons of pineapple. The opportunity cost of producing one ton of pineapple is, therefore, 2 tons of rice.
(c) The Bahamas has a comparative advantage in pineapple (the opportunity cost of 1 ton of pineapple is 0.5 tons of rice as compared to 2 tons of rice in India), and India has a comparative advantage in rice (the opportunity cost of 1 ton of rice is 0.5 tons of pineapple as compared to 2 tons of pineapple in the Bahamas).
(d) The Bahamas would produce 100 tons of pineapple and India would produce 100 tons of rice. Dividing the goods equally each would have 50 tons of pineapple and 50 tons of rice (shown by point A in the graph below), which is a greater combination of goods possible without trade.