

## Chapter 2

# USEFUL TOOLS AND CONCEPTS

*Macroeconomics in Context (Goodwin, et al.)*

### Chapter Overview

This chapter introduces standard concepts of economic modeling, efficiency, scarcity, opportunity cost, the Production Possibilities Frontier, and the advantages of market systems, and includes a review of graphing techniques. In this chapter you will see these concepts set into a broader context of concern for well-being. The chapter discusses the institutional requirements of markets and introduces the concepts of externalities, public goods, market power, transaction costs, information and expectations and concern for human needs and equity in order to demonstrate why markets, while useful, are not on their own sufficient for organizing economic life in the service of well-being.

### Chapter Objectives

After reading and reviewing this chapter, you should be able to:

1. Distinguish and differentiate among the different methods of investigation: empirical investigation, theoretical investigation, and historical investigation.
2. Understand the concept of economic tradeoffs (or opportunity costs) in the face of abundance or scarcity.
3. Interpret and apply the Production Possibilities Frontier.
4. Distinguish the different meanings of the term “market,” and describe how the market is understood in the basic neoclassical model.
5. Describe the institutional requirements of markets.
6. Identify the advantages and limitations of markets.

### Key Terms

empirical investigation

time series data

negative (or inverse) relationship

positive (or direct) relationship

theoretical investigation

model

ceteris paribus

historical investigation

abundance

scarcity

production possibilities frontier

opportunity cost

efficiency technological  
progress  
market (three meanings)  
institutions  
basic neoclassical  
    (traditional  
    microeconomic)  
    model  
private  
property  
implicit  
contract  
explicit  
contract  
physical  
infrastructure  
public goods  
free riders  
externalities

transactions costs  
market power  
static analysis

dynamic analysis  
market failure

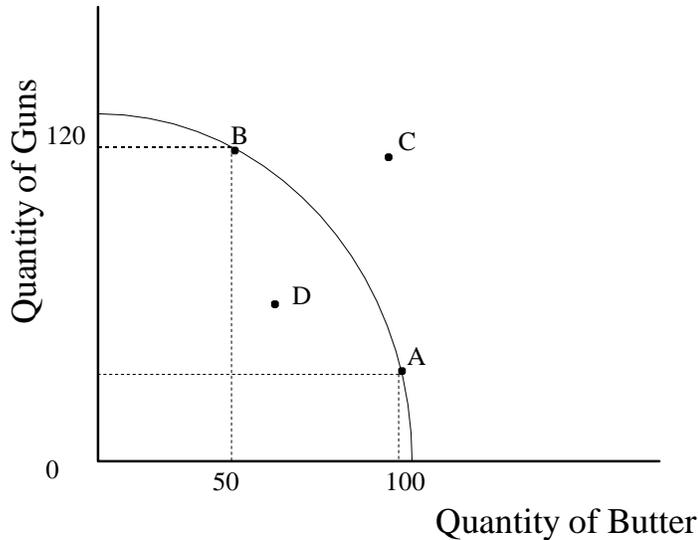
### Active Review

#### *Fill in the Blank*

1. The observation and recording of specific phenomena of concern is called \_\_\_\_\_ investigation, whereas the analysis based in abstract thought is called \_\_\_\_\_ investigation.
2. When researchers study past events, they are conducting a(n) \_\_\_\_\_ investigation.
3. The Latin phrase that means “all else constant” or “other things equal” is \_\_\_\_\_.
4. A diagram that shows the tradeoffs between production of two goods is called a(n) \_\_\_\_\_.
5. You’re deciding whether to take an Economics course, or to take an Anthropology course. The \_\_\_\_\_ cost of taking the Economics course is the course you’re having to forego, the Anthropology course.
6. A process that achieves the maximum value of output from the given set of inputs can be described as \_\_\_\_\_.
7. If someone enjoys the benefit of a well-paved highway but refuses to pay for it, they would be considered a \_\_\_\_\_.
8. You decide to buy a used car. You discover that it is hard to get information on the quality of the used cars that are available. You have trouble communicating with the car dealer. It takes a considerable amount of time to get the information you need to successfully get the car you had in mind. In other words, buying a used car turns out to be an activity with high \_\_\_\_\_ costs.
9. A new factory begins discharging pollutants into a previously pristine river. Fish in the river begin to die, and people who make their living through fishing have trouble maintaining their catch. This factory is generating negative \_\_\_\_\_.
10. A professional musician practices piano every afternoon. Her neighbor listens to the music and enjoys it. Through her activity, the musician is creating a positive \_\_\_\_\_.

*True or False*

Questions 11 to 13 refer to the production possibilities frontier shown below.



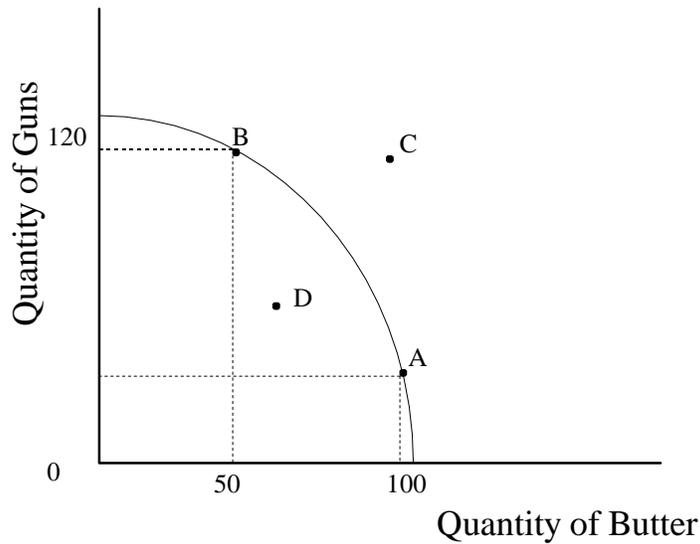
11. In the graph shown above, at point B, society is producing the maximum possible amount of butter.
12. To move from point A to point B, society would have to cut down on its gun production and increase butter production.
13. Starting from point B, society would have to shift substantial resources to increase gun production.
14. A public good is a good that is consumed by the public.
15. Public goods, externalities, transactions costs, market power, the difficulty of getting information, and concern for human needs and equity are all examples of issues that lead to market failure.

*Short Answer*

16. Assume you see that two macroeconomic variables are correlated with each other. But you want to know if there's an underlying or causal relationship between the two variables. Would you use an empirical or theoretical investigation? Explain why.

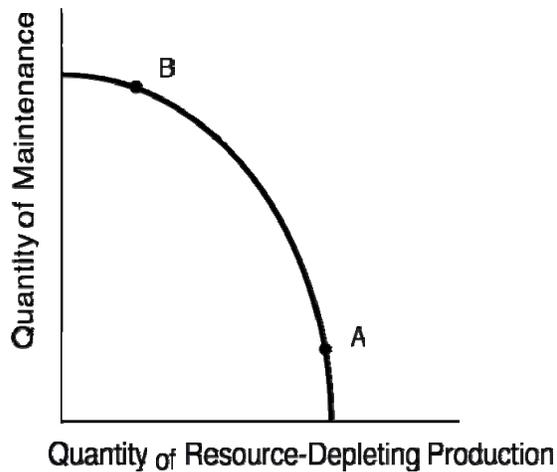
17. Why does a production possibilities frontier with increasing opportunity costs have a bowed-out shape?

18. Consider the following PPF:



Identify points that are a) inefficient and b) unattainable. How might a country be able to produce a combination of goods and services that was otherwise unattainable?

19. Consider the following Production/Maintenance frontier.



What would the future PPF look like if a high level of resource maintenance (e.g. point B) were chosen now? If a high level of resource depleting production (e.g. point A) were chosen now?

20. Provide an example of a market that fits the first meaning of markets (as a physical place), and an example of a market that fits the second definition (as an institution).

21. Name the two actors in the basic neoclassical (or traditional microeconomic) model of economics, and identify the assumptions the model makes of these two actors.

22. What does the basic neoclassical, or traditional, model of economics assume about markets?

23. List two advantages of markets identified by the authors of the text.

24. Identify the four institutional requirements of markets.

25. Identify six disadvantages of markets (i.e. cases of market failures).

## Problems

1. Given the following data:

Year	Unemployment Rate (percent)	Inflation Rate (percent per year)
1984	7.5	3.8
1985	7.2	3.0
1986	7.0	2.2
1987	6.2	2.7

Source: Economic Report of the President

a. Plot the unemployment data on a time series graph:

b. Plot the inflation data on a time series graph:

c. Now plot the unemployment and inflation data using a scatter diagram. Over any period of years is there a positive relationship between the two variables? Over any period is there a negative relationship?

2. Suppose that a society could produce the following maximum combinations of schools and airplanes in a given year:

Alternative	Quantity of schools	Quantity of airplanes
A	100	0
B	80	30
C	60	50
D	40	60
E	20	65
F	0	68

a. Draw a production possibilities frontier (PPF) with schools on the horizontal axis and airplanes on the vertical axis. Assume that the dots define a complete curve.

b. Is it possible and/or efficient for this society to produce 50 airplanes and 80 schools?

c. If society is currently producing at alternative C, then the opportunity cost of increasing the output of schools from 60 to 80 is \_\_\_\_\_ airplanes.

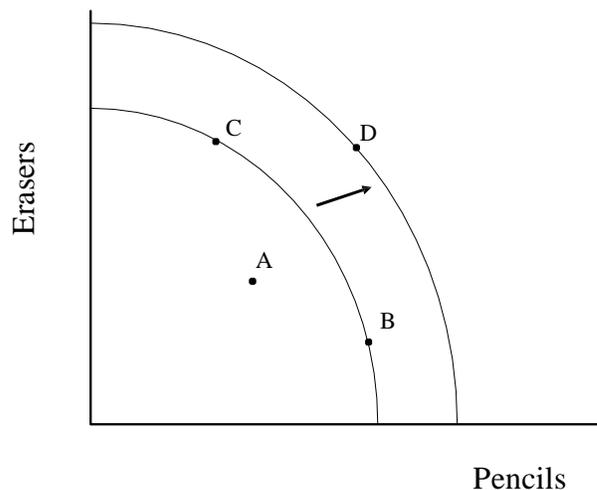
d. If society is currently producing at alternative E, then the opportunity cost of increasing the output of schools from 20 to 40 is \_\_\_\_\_ airplanes.

e. Is the opportunity cost of producing schools higher or lower moving from alternative C to B, than moving from E to D? Explain why.

## Self Test

1. Suppose an investigator has 50 years of data on rates of industrial production and annual accumulations of CO<sub>2</sub>, and discovers a positive relationship between the two variables. This is an example of what type of investigation?
  - a. Theoretical investigation
  - b. Empirical investigation
  - c. Historical investigation
  - d. Both A and B.
  - e. A, B, and C.
2. What does the Production Possibilities Frontier represent?
  - a. A catalog of all possible production options, represented as percentages.
  - b. The tradeoffs between production and consumption options.
  - c. The tradeoffs between possible production levels for two goods.
  - d. The amount that a society could produce if it devoted all its resources to producing one good.
  - e. The possible gains from international trade in two or more goods.
3. Which of the following factors could expand a society's production possibilities frontier?
  - a. Increased butter production.
  - b. Shifting from one product to another.
  - c. Producing air pollution.
  - d. Depleting resources now instead of later.
  - e. Technological innovations.

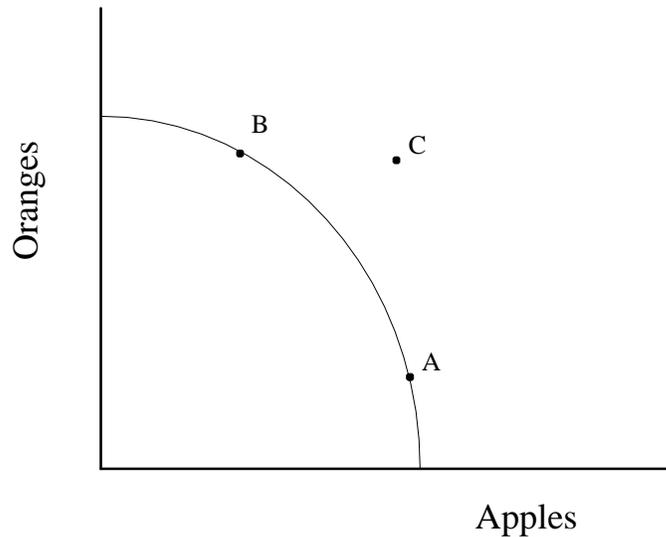
Questions 4 and 5 refer to the following scenario:



An economy produces two goods: pencils and erasers. Use the graph shown above depicting two possible production possibilities frontiers (PPFs) for this economy to answer questions 4 and 5.

4. Which of the following events could cause the PPF to shift out?
  - a. Workers become less productive due to poor working conditions.
  - b. A hurricane destroys vital resources for pencil production.
  - c. A new machine is invented that makes it easier to produce both pencils and erasers.
  - d. All production costs rise proportionally.
  - e. The cost of eraser inputs goes up.
  
5. Which of the following statements is true?
  - a. Moving from point C to point B requires shifting resources away from eraser production and into pencil production.
  - b. Point B represents a less efficient resource mix than point C.
  - c. Depletion of nonrenewable resources could lead the economy to shift from point C to point D.
  - d. Utility is maximized at point A.
  - e. At point A, society is producing all the pencils it can.
  
6. The nation of Anyplace produces two goods, chairs and tables. Anyplace can produce the chairs and tables using either sustainable methods or resource-depleting methods. If Anyplace chooses resource-depleting methods, which of the following statements is true?
  - a. Eventually the PPF of Anyplace will shift outward (away from the origin).
  - b. Eventually the PPF of Anyplace will shift inward (toward the origin).
  - c. Eventually the PPF of Anyplace will pivot, causing a change in the slope of the curve.
  - d. Eventually Anyplace will have to choose between producing only chairs or producing only tables.
  - e. None of the above

Question #7 refers to the graph shown below:



7. Which of the following statements is true?

- a. Point A is inefficient.
- b. Point B is inefficient.
- c. Point A is preferred to point B.
- d. Point B is preferred to point A.
- e. Point C cannot be attained with current technology.

8. Suppose there is a production possibilities frontier (PPF) for wine and cheese. Which of the following situations would shift the PPF inward (toward the origin)?

- a. A severe weather event that destroys much of the economy's productive capacity.
- b. Discovery of a new, cheaper source of milk for making cheese.
- c. Increased popularity of wine, as compared with cheese.
- d. A technological breakthrough.
- e. Improved education of the work force.

9. Which of the following is *not* an example of resource maintenance activities that can lead to the PPF shifting outward in the future?

- a. Investment in plant, equipment, and physical infrastructure
- b. Investment in education and knowledge
- c. Investment in international diplomacy and conflict resolution
- d. Conservation of non-renewable resources such as fossil fuels
- e. Mandatory overtime and cutbacks in vacations that leave workers exhausted and in bad mental or physical health

10. In general, as production of a good increases, the opportunity cost of production increases. How is this notion reflected in the graph of production possibilities frontier (PPF)?

- a. The PPF bows inwards (that is, looks like a slide or a valley)
- b. The PPF bows outwards (that is, looks like a hillside).
- c. The PPF shifts in response to technological change.
- d. The PPF shows production of one good at a time.
- e. The PPF becomes flatter as resource availability increases.

11. Which of the following would *not* be considered a market by any of the three meanings of markets?

- a. Seattle's Pikes Place Market, a tourist attraction known for its fish and flower stands.
- b. The mall of America in Minnesota, the U.S.'s largest retail and entertainment complex.
- c. The capitalist free market
- d. The stock market
- e. Marketplace, the radio program on national public radio.

12. Which one of the following is *not* an assumption of the basic neoclassical model?

- a. The actors in the economy are assumed to be households and firms
- b. Firms are assumed to maximize profits
- c. Households are assumed to maximize utility
- d. Markets are assumed to be perfectly competitive, with prices determined by supply and demand
- e. Communities are assumed to look after resource maintenance and environmental protection

13. Which of the following statements below best fits the basic neoclassical model's perspective?

- a. Adam thinks that self-interested maximizing behavior and free markets lead to the best of all possible worlds.
- b. Karl thinks that workers are squeezed by greedy, profit-hungry bosses.
- c. Joseph experiences the booms and busts of the economy as if it were a rollercoaster ride.
- d. John thinks the economy is like an elevator that can get stuck in the basement, and can only be fixed by an elevator repairman.
- e. Julie values the work of volunteers and non-profit organizations in their communities that keeps the economy strong and vibrant.

14. Which of the following is *not* an example of an institutional requirement of markets?
- The deed of a house, identifying its owner.
  - A police force devoted to combating theft.
  - A firm's reputation for making quality products.
  - Reliable roads and bridges that won't fall apart
  - Central planners who are able to allocate and distribute resources
15. A city government maintains local roads. This service is an example of:
- A free rider
  - A public good
  - A positive externality
  - An external cost
  - A core sphere activity
16. Why are public goods often provided through government agencies and supported by taxes?
- Because they are goods that the public generally believes are valuable and important for the smooth functioning of the economy.
  - Because the goods would not be well-provided by the private sector, since they are non-excludable.
  - Because consumers of the goods have little incentive to pay for them, since they are non-excludable.
  - Because of the problem of free riders, who would otherwise benefit from the public good without paying for it.
  - All of the above.
17. Which of the following is an example of a positive externality?
- A musician performs in a concert. People pay to listen to the concert.
  - An architect designs a house for herself to live in. She enjoys spending time in the house.
  - A student volunteers in a shelter for the homeless.
  - A homeowner plants a tree for shade around her house. The tree also provides shade for her next-door neighbor.
  - A teacher drives his car to work and gets stuck in a traffic jam.

18. Which of the following is an example of a negative externality?
- A student receives a failing grade on a French exam.
  - Your roommate throws a loud party that keeps you awake all night.
  - You decide to take public transportation to work every day.
  - A group of farmers pool their resources to purchase seeds for next year.
  - You receive a letter saying your bank account is overdrawn.
19. A firm has an experienced worker who it has spent considerable time training. The economy goes into a recession, but the firm is reluctant to lay off the worker. Searching for another worker who is trained and trustworthy when the economy picks up again would entail which kind of costs?
- Opportunity costs
  - Implicit costs
  - Explicit costs
  - Transactions costs
  - External costs
20. Which of the following entities does *not* have substantial market power?
- An oil company like Exxon Mobil.
  - A multinational soft drink corporation like Coca Cola.
  - A government agency like the Department of Defense.
  - A computer software company like Microsoft.
  - A flower seller at a local farmers' market, where there are many flower sellers.

### Answers to Active Review Questions

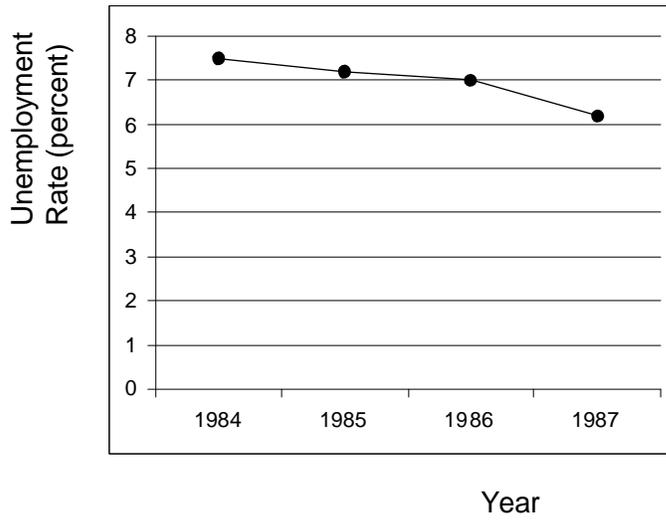
- empirical, theoretical
- historical
- ceteris paribus
- production possibility frontier
- opportunity (cost)
- efficient
- free rider
- transactions (costs)
- externalities
- externality
- False. Society could produce more butter by producing fewer guns.
- False. To move from A to B, society would have to decrease butter production and increase gun production.
- True. At point B, society is already employing many of its resources to produce guns. Increasing gun production further will present high opportunity costs.
- False. A public good is a good that is non-diminishable (use by one person does not

diminish usefulness to others), and non-excludable (it would be difficult to exclude anyone from benefiting. There are many examples of goods consumed by the public that are not public goods.

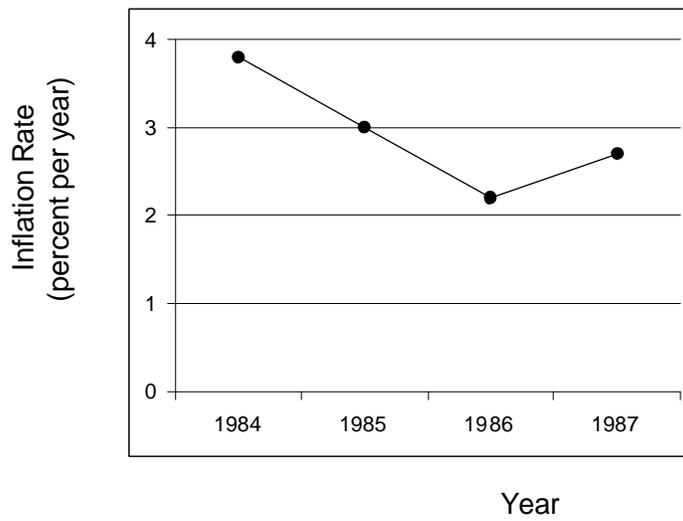
15. True. These are all cases in which the market form of organization leads to inefficient or harmful results.
16. You would use a theoretical investigation. Empirical investigation is useful in describing macroeconomic phenomenon, but may be inadequate in explaining them. It may be clear that two variables are correlated, but unclear if there's a causal relation between the two. Theoretical investigation can more closely examine complex relationships between phenomena.
17. The curve is bowed-out because some resources are better suited for the production of one good (e.g. butter) rather than the other (e.g. guns). And as we try to produce more and more of the other good (e.g. guns), it takes increasing amounts of resources to do so and thus we incur increasing opportunity costs.
18. Point D is inefficient and point C is unattainable. One could get to an unattainable point such as point C through technological progress, or the acquisition of additional resources.
19. If Point B were chosen, the PPF would shift outwards, leading to a larger set of production possibilities in the future. If Point A were chosen, the PPF would shift inwards, leading to a smaller set of production possibilities in the future.
20. A local farmer's market would be an example of a market understood as a physical place with both buyers and sellers of a good. The market for goods sold on eBAY, the stock market or the market for oil, are examples of markets understood as institutions.
21. Firms and households. Firms are assumed to maximize profits, and households are assumed to maximize their utility (or satisfaction).
22. It assumes that markets are perfectly competitive and smoothly functioning, and that prices are determined purely by forces of supply and demand.
23. Markets can be an efficient way of allocating resources. Markets involve voluntary exchanges. Another advantage identified in the text is that markets encourage innovation and creativity.
24. The four institutional requirements of markets are: private property, social institutions of trust, good physical infrastructure, and money.
25. Six disadvantages or cases of market failure are: public goods, externalities, market power, inequality, transactions costs, and information/expectations problems.

## Answers to Problems

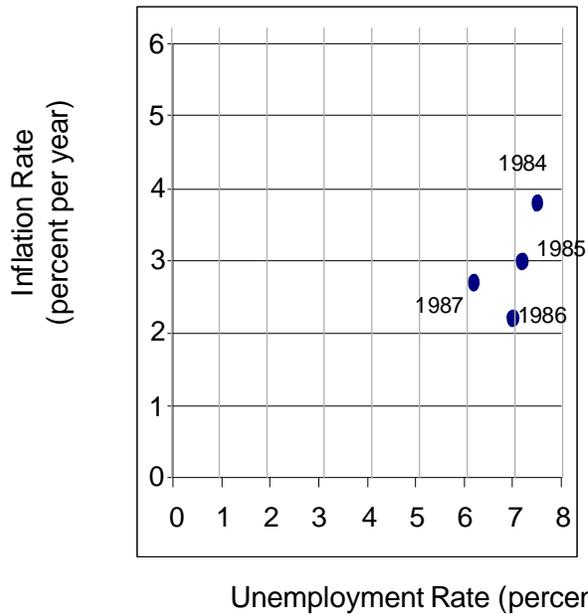
1.a.



b.

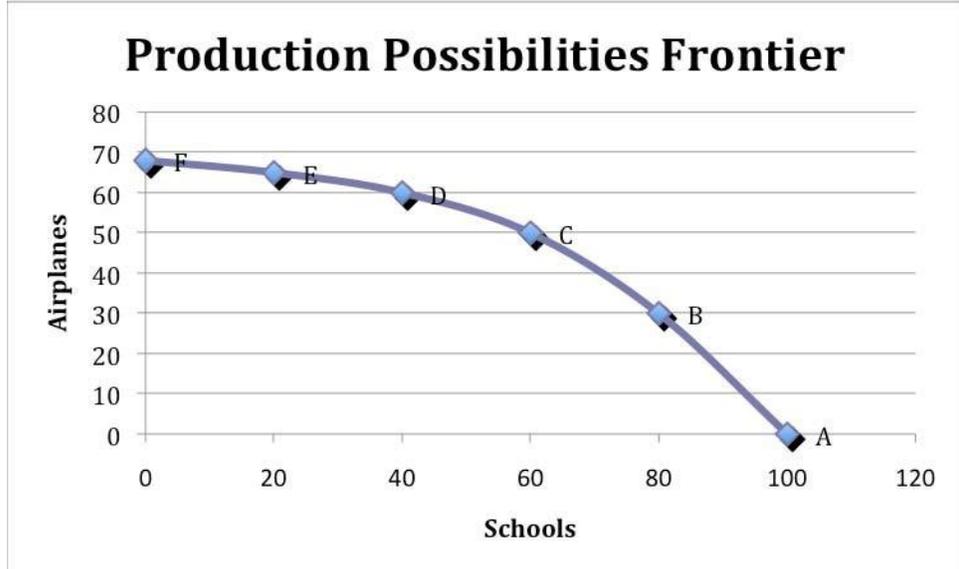


c.



There appears to be a positive (direct) relationship between unemployment and inflation from 1984 to 1986 (both are falling), but an negative (inverse) relationship between them from 1986 to 1987 (unemployment falls while inflation rises).

2. a.



b. No, 50 airplanes and 80 schools is unattainable, because it's beyond the PPF.

c. To go from 60 to 80 schools, 20 airplanes must be given up. Thus the opportunity cost of 20 schools is 20 airplanes.

d. To go from 20 schools to 40 schools, 5 airplanes must be given up. Thus, the opportunity cost of 20 schools is 5 airplanes, starting from alternative E.

e. The opportunity costs of moving from C to B is higher than it is moving from E to D. As we try to get more and more schools, we're using resources not as well suited into the production of schools, incurring increasing costs.

### Answers to Self Test Questions

- |       |       |
|-------|-------|
| 1. B  | 11. E |
| 2. C  | 12. E |
| 3. E  | 13. A |
| 4. C  | 14. E |
| 5. A  | 15. B |
| 6. B  | 16. E |
| 7. E  | 17. D |
| 8. A  | 18. B |
| 9. E  | 19. D |
| 10. B | 20. E |