Study Guide to Accompany Samuelson-Nordhaus

-MICRO-ECONOMICS

FIFTEENTH EDITION

LAURENCE MINERS
KATHRYN NANTZ

STUDY GUIDE

TO ACCOMPANY
SAMUELSON-NORDHAUS

MICRO-ECONOMICS

FIFTEENTH EDITION

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For Cathy and Rich

STUDY GUIDE TO ACCOMPANY
SAMUELSON-NORDHAUS: MICROECONOMICS

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TO THE STUDENT

STOP EVERYTHING! Before you begin using this *Study Guide,* read this short introduction. We would like to tell you some things about our plan for this book so that you will learn as much as possible from using it.

Our overall goal in writing the material is to help you to understand economics. Each chapter in the *Study Guide* consists of nine parts.

I. Chapter Overview
II. Learning Objectives
III. Review of Key Concepts
IV. Summary and Chapter Outline
V. Helpful Hints
VI. Multiple Choice Questions
VII. Problem Solving
VIII. Discussion Questions
IX. Answers to Study Guide Questions

We begin with an overview of the chapter material. This is followed by a list of learning objectives. To get you into the material, section III consists of a matching exercise that reviews the key terms in the chapter. The summary in section IV outlines important topics and clarifies information found in the text. Subheadings in this section correspond to those in the text, providing you with the ability to use the *Study Guide* and textbook together. Some of you may want to bypass this section and head straight for the problems; however, most of you will find that the summary organizes the material from the text in a more concise way and provides additional insights into the course material.

The Helpful Hints section is our favorite. We have provided you with our most important insights from our over thirty years of combined classroom and teaching experience. Much wisdom is contained in these sections; these tips can help you to fine-tune your understanding of difficult concepts. The remainder of each chapter consists of problems and exercises for you to work through, along with a final section containing answers to all these questions. Note that the organization of the multiple-choice and problem-solving exercises follows the text chapter outline. We strongly recommend that you work on these exercises *before* you look at the answers. Treat each exercise like a quiz or a test. Use the answers only as a last resort and to check your work.

Economists are very fond of building models, drawing diagrams, and using mathematics to describe behavior. *Do not let this intimidate you!* Remember that models are just simplified pictures of reality, designed to help you to understand complex economic relationships. Take time early in the course to connect the verbal descriptions with the illustrations in the diagrams; these go hand-in-hand and should be used together. Do not feel bad if you need to spend twenty or thirty minutes working through a single page of text sometimes. Your efforts will pay off with a better understanding of course material and maybe with a higher course grade.

A word to the wise: Economics may be very different from other subjects that you have studied. Its usefulness lies in its application to real world situations. You must be able to *do* economics, it is not enough just to *know* it. This means that you

cannot stop after you have read the material, you must be able to work with and apply economic concepts. We like to think of it this way: although we have both spent many hours watching great players play basketball and although we understand the rules of the game, we will not be good players ourselves until we practice, practice, practice.

Acknowledgments

Preparation of this text has been challenging and rewarding for both of us. We must begin by thanking our families for all of their support through the project; the deadlines were deadly. Our every conversation with family members began with the question, "What chapter are you on?" Having often read similar acknowledgments written by other authors, we only now understand how truly appropriate they are.

At McGraw-Hill, we would like to thank our editors, Scott Stratford and Victoria Richardson, for their help and encouragement. Also, we are grateful to Bruce K. Johnson of Center College and Craig Keller of Southwest Missouri State University who made very helpful suggestions that we hope we have addressed to their satisfaction.

Laurence Miners
Kathryn Nantz

CONTENTS

PART FIVE
INTERNATIONAL TRADE AND THE WORLD ECONOMY

CHAPTER 1

The Fundamentals of Economics

I. CHAPTER OVERVIEW

In this beginning chapter basic economic concepts are discussed. The first part of this chapter has been designed to provide a rough outline of what the discipline of economics is all about. The primary objective here is to give you the "lay of the land," as well as a feel for why people would ever want to concern themselves with the study of economics in the first place. We need to consider how, in broad and general terms, such a study should be conducted.

In the second part of the chapter the three main problems of economic organization are presented and discussed. In the last section there is a discussion of the production-possibility frontier that every society faces. Together, these sections help to describe the constraints placed on all economies as they deal with the problem of scarcity.

Finally, there is an appendix to this chapter, focusing on the use of graphs in economic analysis. Basic equations related to the use and interpretation of graphs are presented. Following the format of your text, there is an appendix to this chapter in the *Study Guide* that you can use to review this material.

II. LEARNING OBJECTIVES

After you have read Chapter 1 in your text and completed the exercises in this *Study Guide* chapter, you should be able to:

1. Recognize that while there are numerous specific examples of economic problems and decisions, they are all illustrations of the *basic definition of economics: Economics is the study of how societies use scarce resources to produce valuable commodities and distribute those commodities among various people.*
2. Understand the *what*, the *how*, and the *for whom* of economic decision making.
3. Define the three primary inputs in the production of outputs: land, labor, and capital.
4. Distinguish between microeconomics and macroeconomics.
5. Distinguish between positive and normative economics.
6. Understand the concept of *productive efficiency* and how it relates to both the use of **inputs** and the basic definition of economics.
7. Use the **production-possibility frontier** to illustrate the choices that societies face.

III. REVIEW OF KEY CONCEPTS

Match the following terms from column A with their definitions in column B.

A	B
5 Scarcity	**1.** The branch of economics concerned with the overall performance of the economy.
3 Efficiency	**2.** Commodities or services, such as land labor or capital, that are used by firms in their production processes.
10 Free goods	**3.** Using the economy's resources as effectively as possible to satisfy people's needs and desires.
8 Economic goods	**4.** Describes the facts and behavior of an economy.
1 Macroeconomics	**5.** Commodities and resources that we value are limited in supply.
11 Microeconomics	**6.** Goods and services that result from the production process.
9 Normative economics	**7.** A market economy in which the government has almost no role.
4 Positive economics	**8.** Goods that we value that are limited in supply.
7 Laissez-faire economy	**9.** Involves value judgments and ethical precepts about an economy.
2 Inputs	**10.** Commodities and resources that are available without limit.
6 Outputs	**11.** Branch of economics concerned with the behavior of individual entities such as markets, firms, and households.

IV. SUMMARY AND CHAPTER OUTLINE

This section summarizes the key concepts from the chapter.

A. Introduction

1. Economics exists as a discipline of study because the "things" that we value in our world are not available in a limitless supply. These "things" include, but certainly are not limited to, raw materials and resources, clean air and water, and all types of manufactured goods and services. If everyone in the world had all they could possibly hope for, there would be no need for economics.

2. Economics is the study of how societies use scarce resources to produce valuable commodities and distribute them among different people.

3. In an attempt to meet the (unfulfilled) needs of people, economies strive to produce goods and services efficiently. When an economy is producing efficiently, it cannot produce more of one good without producing less of another.

4. Within the study of economics, a significant distinction is made between the behavior of individual components of an economy (individuals, households, firms, industries, etc.), on the one hand, and the functioning of the economy taken as a whole, on the other. The former, called **microeconomics,** looks at the small building blocks of a larger system. How are vegetable prices set? How do people negotiate their employment contracts? These are the types of questions that are asked in the study of microeconomics.

5. By way of contrast, **macroeconomics** focuses on broader sorts of questions. What is the relationship (if any) between the rate of unemployment and the rate of inflation? What should we expect to see as a consequence of enormous federal government budget deficits? These are typical macroeconomic issues.

6. The textbook distinction between microeconomics and macroeconomics is somewhat less clear in reality. Unemployment, for example, is not just a national problem, but a household problem as well. When is an industry so large that an analysis of its response to a certain tax treatment is a question of macroeconomics rather than microeconomics? Recognizing this blurring is not, however, nearly as important as recognizing that macroeconomic and microeconomic views of how the world behaves must be consistent with each other.

B. The Three Problems of Economic Organization

1. Since we are faced with both scarcity and the wants of the people, each society must decide "what" goods and services to produce. No country has enough resources to meet *all* the wants of *all* its citizens. Scarcity means that choices have to be made.

2. "How" deals primarily with the production process. Typically, there may be several different ways of producing a particular product. For example, a painter could use a compressor and spray gun to paint a building. Alternatively, the painter could hire several workers with paintbrushes to help with the work. Depending upon the availability (and cost) of these alternative **inputs,** either method could prove to be the best way to do the job. **Technology,** or the knowledge used to combine inputs, is also an important factor in determining *how* to produce outputs.

3. Finally, society must determine who will get the outputs that are produced. This is the "for whom" part of the economic problem. This is a very difficult decision, and often issues of fairness and equity come into play when deciding how to distribute a nation's output.

4. There are two fundamentally different ways that societies use to address these three problems. In a **market economy** individuals and private firms make the major decisions about *what, how,* and *for whom.* In a **command economy** these decisions are made by the government. No contemporary society falls completely into either of these polar categories. Rather, all societies are **mixed economies,** with elements of both market and command decision making.

C. Society's Technological Possibilities

1. Firms use **inputs** to produce goods and services, which are called **outputs**. The three main categories of inputs are **land, labor,** and **capital**.

2. The *land* includes the earth itself and all the precious (and scarce) **natural resources** that we get out of it. In our congested world we need to broaden our definition of "land" beyond natural resources and include **environmental resources** such as air, water, and climate. These, too, are becoming scarce and are often adversely affected by our production decisions.

3. *Labor* consists of all human time spent in production. There are skilled workers and unskilled workers. There are managers and assembly line workers. There are doctors, lawyers, engineers, and even economists. Labor is both the most familiar and the most crucial input for an advanced industrial economy. Resources and capital may be imported—every country has a labor force.

4. *Capital* resources are durable goods, the output of some previous production process, which are then used to produce other goods and services. Examples of capital goods include factories, trucks, computers, washing machines, compressors, and spray guns for paint.

5. Economists often use diagrams to explain economic concepts. The *production-possibility frontier* (*PPF*) is used to illustrate the concept of scarcity and the production choices that society faces.

V. HELPFUL HINTS

1. All economic issues and problems ultimately relate back to the idea of scarcity. Since we are faced with scarcity, we must make choices. Look back at the eight definitions/examples of economics at the beginning of the textbook chapter. Make sure you see how they relate to the concept of scarcity.

2. All decisions therefore relate in some sense to economics. On a personal level, your time (like your income) is a scarce resource and you continually decide how best to use it. The decision to stay in bed an extra hour, or go to class, or study, or eat breakfast is ultimately tied back to the concepts of scarcity and choice. The sooner you buy into and grasp this most basic notion of economics, the happier you (and your instructor) will be!

3. Inputs are often referred to as **factors of production**. The two expressions can be used interchangeably.

4. Capital is one of those terms (there will be others) that have special meaning for economists. To the noneconomist, "capital" is often used synonymously with money. It is not uncommon for business associates to talk of the capital they have invested in a project. For students of economics, however, capital is a factor of production. It is itself an output from some previous production process. Remember, capital is something physical, like a piece of equipment, that firms use as an input to produce goods and services. Money is not capital.

5. The terms *outputs* and *goods and services* can be used interchangeably.

6. Economists frequently use diagrams, like the production-possibility frontier (*PPF*), to simplify and explain concepts. The *PPF* illustrates the tradeoff that society faces when it produces one good instead of another. Of course, in reality, an economy produces thousands of goods. In a three-dimensional *PPF* diagram, a third axis could be added to show the tradeoff among three goods. While no one can draw a four-dimensional diagram, conceptually the interpretation is the same as for our two-dimensional diagram.

VI. MULTIPLE CHOICE QUESTIONS

These questions are organized by topic from the chapter outline. Choose the best answer from the options available.

A. Introduction

1. Economics is concerned primarily with:
- **a.** money.
- **b.** determining corporate profits and losses.
- **c.** the allocation of scarce resources.
- **d.** balancing your checkbook.
- **e.** all of the above.

2. When Samuelson and Nordhaus write that "Goods are limited while wants seem infinite," they mean that:
- **a.** people are basically greedy and not willing to share.
- **b.** the government needs to redistribute output.
- **c.** current methods of production are inefficient.
- **d.** there is no simple solution to the basic economic problems of scarcity and unlimited human wants.
- **e.** none of the above.

B. The Three Problems of Economic Organization

3. The three fundamental questions of economic organization are:
- **a.** closely related to the concept of scarcity.
- **b.** not nearly as important today as they were at the dawn of civilization.
- **c.** *what, how,* and *why.*
- **d.** *land, labor,* and *capital.*
- **e.** all of the above.

4. The economic problem of *what* goods to produce:
- **a.** may be a problem for any individual firm seeking to make a profit but is not in any sense a problem for society as a whole.
- **b.** can be illustrated as the problem of choosing a point on the production-possibility curve.
- **c.** arises only when the stock of productive resources is very small.
- **d.** arises only when all productive inputs are so specialized that each can be used only in the production of one good and no other.
- **e.** none of the above.

5. The economic problem of *how* to produce goods would not exist:
- **a.** if the required proportions of inputs were fixed for all commodities, so substitution of one input for another input in production would be impossible.
- **b.** if production had not been carried to the point where there was full employment of all the economy's resources.
- **c.** if the economy's stock of capital were small relative to its labor force.
- **d.** in a technically advanced society, since proper technology would have established the best possible method of producing each good.
- **e.** in any circumstance, because the problem of how to produce goods is an engineering problem throughout and not an economic problem.

6. Which of the following statements applies to a mixed economy?
- **a.** There is confusion and a lack of organization.
- **b.** The allocation of resources changes from production period to production period.
- **c.** There are no real examples of truly mixed economies.

d. Mixed economies include aspects of both market and command economies.
e. None of the above statements apply.

C. Society's Technological Possibilities

7. Capital is:
a. the same as money.
b. the headquarters of economic planning.
c. both an input and an output.
d. all of the above.
e. none of the above.

8. Land, labor, and capital are:
a. available only in finite amounts.
b. used to produce outputs.
c. the primary factors of production.
d. combined with technology in the production process.
e. all of the above.

9. Which of the statements below does *not* apply to the production-possibility frontier, or *PPF*?
a. The *PPF* is closely related to the concept of scarcity.
b. Quantities of inputs are measured along the axes of the *PPF*.
c. The *PPF* may shift over time.
d. Movements along the *PPF* may occur as the allocation of resources changes.
e. Technology may change the shape of the *PPF*.

10. Which of the statements below is a reason why an economy might produce a level of output that is beneath its production-possibility frontier?
a. The available resources are not equally suited to the production of both outputs.
b. The available body of technological knowledge is not being fully utilized.
c. Society prefers one product over the other.
d. In reality, economies produce thousands of goods, not just two.
e. There are no frontiers left anymore.

11. Which of the following statements is false? When an economy is on its *PPF*:
a. more of one product cannot be produced without sacrificing some of the other.
b. resources are fully employed.
c. the economy is producing with *productive efficiency*.
d. consumers will have all that they need.
e. a strike by workers will move the economy beneath the *PPF*.

12. Which of the following statements could be used to explain an outward shift in the production-possibility frontier?
a. There is an increase in technology.
b. The population of the country increases.
c. The country decides to postpone current consumption in favor of capital investment.
d. New natural resources are discovered under the ocean.
e. All of the above apply.

13. Which of the following are measured along the axes of a *PPF* graph?
a. quantities of productive inputs or resources.
b. quantities of finished commodities.
c. values of finished commodities.
d. all of the above.
e. none of the above.

14. Each and every point in a production-possibility diagram (whether on the curve or off it) stands for some combination of the two goods produced. With a given input stock, some of these points are attainable, while others are not. Specifically, with respect to production, the economy *could* operate:
a. anywhere on the curve and only on the curve.
b. anywhere on the curve or anywhere inside it (below and to the left).
c. anywhere on the curve, inside it, or outside it.
d. all of the above.
e. none of the above.

15. In order to shift the *PPF* out (above and to the right), an economy would have to:
a. somehow increase its stock of inputs.
b. remove some incompetent bureaucrats from their jobs.
c. eliminate the sources of significant abuse of monopoly power.
d. all of the above.
e. none of the above.

16. If an economy did somehow add to its input stock, or if it did discover new production techniques, then the production-possibility curve would:
a. remain unchanged.
b. move appropriately inward and to the left.
c. move appropriately outward and to the right.
d. all of the above.
e. none of the above.

Please use Figure 1–1 to answer questions 17 through 20.

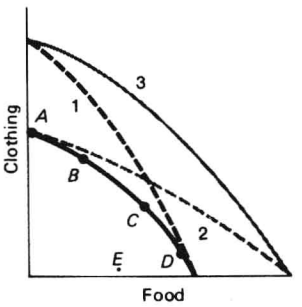

FIGURE 1–1

17. On the dark production frontier labeled *ABCD*, which point corresponds to the economy's valuing food most heavily?

a. A.
b. B.
c. C.
d. D.
e. E.

18. A shift in the dark *PPF* curve to the position indicated by the line marked "1" would be appropriate to illustrate:
a. a change in the tastes of the population whereby its members want more food produced and less clothing.
b. the appearance of some new resources useful only in the clothing industry.
c. an improvement in technology applicable to both industries.
d. a change in the production mix involving an increase in clothing output and a decrease in food output.
e. the development of a better technology in the food industry alone.

19. Which alternative in question 18 would have applied if the dark *PPF* had shifted to position 2?
a.
b.
c.
d.
e.

20. Which alternative in question 18 would have applied if the dark *PPF* had shifted to position 3?
a.
b.
c.
d.
e.

Please use Figure 1–2 to answer questions 21 through 23.

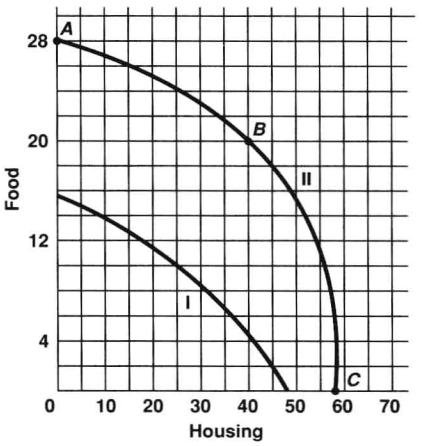

FIGURE 1–2

21. As the economy moves from point *A* to point *B:*
a. it gives up 8 units of housing and gains 40 units of food.
b. it gives up 8 units of food and gains 40 units of housing.
c. idle resources become fully employed.
d. the economy becomes more efficient.
e. there is a breakthrough in technology.

22. As the economy moves from point *B* to point *C:*
a. it gives up 20 units of food and gains about 17 units of housing.
b. it gives up 20 units of housing and gains about 17 units of food.
c. idle resources become fully employed.
d. the economy becomes more efficient.
e. there is a breakthrough in technology.

23. Assume that an advance in technology is responsible for the shift from *PPFI* to *PPFII.* It appears that technology:
a. affected both industries equally.
b. had a relatively greater influence on the food industry.
c. had a relatively greater influence on the housing industry.
d. was actually destroyed.
e. none of the above.

VII. PROBLEM SOLVING

The following problems are designed to help you apply the concepts that you learned in the chapter.

A. Introduction

1. To exercise your understanding of the distinction between *micro*economics and *macro*economics, consider the following list of publications. Each appears in a footnote somewhere later in the textbook. On the basis of the content suggested by the titles, indicate whether you expect the research to be primarily related to *micro* or *macro* economics. Use the letters **MI** for *micro,* and **MA** for *macro.*

a. Arthur Okun, *The Political Economy of Prosperity* ___
b. Orley Ashenfelter, "Union Relative Wage Effects," in Stone and Petersen (eds.), *Econometric Contributions to Public Policy* ___
c. Edward Denison, "Is U.S. Growth Understated because of the Underground Economy? Employment Ratios Suggest Not," *Review of Income and Wealth* ___
d. R. J. Gordon, "Inflation, Flexible Exchange Rates and the Natural Rate of Unemployment," in M. N. Baily (ed.), *Workers, Jobs and Inflation* ___
e. A. A. Berle, Jr., and Gardner Means, *The Modern Corporation and Private Property* ___

B. The Three Problems of Economic Organization

2. This question focuses on the difference between *normative* and *positive* economic statements. Indicate which

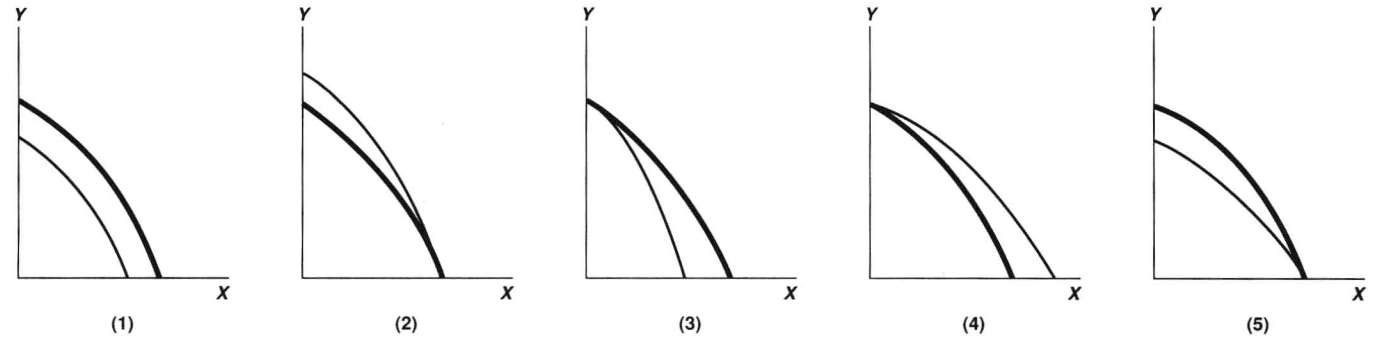

FIGURE 1–3

of the following are statements of *normative* (**N**) or *positive* (**P**) character.

a. Taxes should be progressive. ___
b. Taxes discourage work effort. ___
c. Inflation tends to be high when unemployment is low. ___
d. Inflation is less harmful than unemployment. ___
e. Pollution restraints cost jobs. ___
f. Pollution restraints are worth the cost. ___

C. Society's Technological Possibilities

Capital is essential to any modern economy, and a heavy reliance on capital is a characteristic of successful advanced economies in the world today.

3. Circle *all* the following *that qualify* as capital:
a. An oil refinery.
b. An issue of General Motors stock.
c. Cash in a business owner's safe.
d. A screwdriver used by a carpenter.
e. Money borrowed by a business firm from a bank to expand its operations.
f. A steel-ingot inventory held by a steel company.
g. Unsold automobiles held by an auto manufacturer.
h. An inventory of groceries held by a supermarket.

4. Any developed nation possesses a large stock of capital, and much of each day's productive effort goes into maintenance and expansion of that stock. Consequently, today's productive effort to maintain and expand capital is significantly devoted to satisfying ***(yesterday's / today's / tomorrow's)*** needs, while the consumer goods actually enjoyed today result from ***(yesterday's / today's / tomorrow's)*** effort.

5. Circle as many of the following as are correct:
a. The larger the available stock of capital, the larger the output of consumer goods that is possible.
b. In terms of a production-possibility frontier, additions to the stock of capital can push the frontier upward and outward.
c. A decision to produce or to not produce more capital goods is not part of the decision of *what* goods to produce.
d. In a fully employed economy, a decision to produce more capital goods is a decision to produce fewer consumer goods in the immediate future.

Consider the production-possibility curves drawn in Figure 1–3. Use the different *PPF*s to answer questions 6 through 10. In each panel the *lighter* schedule represents an *original* curve, while the *darker* schedule represents what happens to the frontier after something has *changed* the economy.

6. Suppose that scientific invention increased the productivity of resources used only in the production of *X*. Which panel most accurately reflects this development? ___

7. Many scientists believe that we are exhausting our natural resources. Assume that natural resources used to produce *X* are being depleted, but that the production of *Y*, at least for the time being, is not affected. ___

8. Assume that the labor force grows and the new workers receive specialized training to produce commodity *Y*. ___

9. Technological knowledge increases and both industries benefit, more or less equally, from the new technology. ___

10. A war depletes some of the resources used to produce *X*. ___

VIII. DISCUSSION QUESTIONS

Answer the following questions, making sure that you can explain the work you did to arrive at the answers.

Table 1–1 shows the production possibilities for the country of Economainia for two commodities: apartments and

TABLE 1–1 Economainia's Production Possibilities

Apartments (thousands of units)		*Bread (millions of loaves)*
0	A	30
6	B	29
12	C	26
18	D	22
24	E	16
30	F	0

bread. At each production point listed in Table 1-1, all of Economainia's resources are fully employed and all the available technological knowledge is being utilized.

1. Use Figure 1–4 to plot the points and draw Economainia's *PPF*. Use the letters from the table (A through F) to label the points on your *PPF*. Before you start, note how the axes on the diagram are labeled.

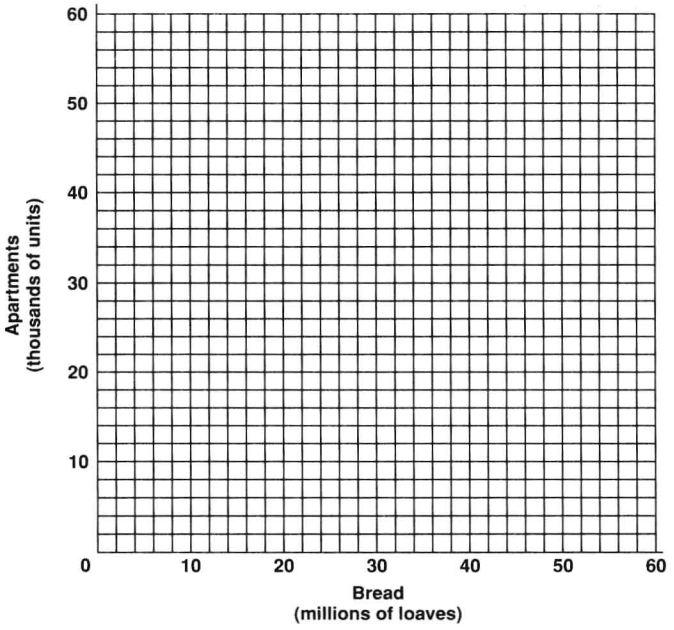

FIGURE 1–4

2. Is point *C* a point of productive efficiency? Please explain. What about points *A*, *B*, *D*, *E*, and *F*?

3. Find the point where Economainia is producing 16,000 apartments and 10,000,000 loaves of bread. Label this point *G*. Assuming that your *PPF* remains where it is (at least for now), list two reasons why Economainia could be producing at point *G*.

TABLE 1–2 Economainia's New Production Possibilities

Apartments (thousands of units)	*Bread (millions of loaves)*
0	50
6	48
12	46
18	40
24	34
30	26
36	16
42	0

4. Is point *G* a point of productive efficiency? Please explain.

5. Suppose Economainia's *PPF* shifts so that it now goes through point *G*, and *not* points *A* through *F*. Draw this new *PPF* on your diagram. What could have caused this shift in the *PPF*?

6. Find the point where Economainia is producing 50,000 apartments and 50,000,000 loaves of bread. Label this point *H*. Given your current *PPF*, can Economainia actually produce this combination of goods? Please explain why, or why not.

Suppose some changes occur in the Economainian economy such that a new set of production possibilities becomes possible. Table 1–2 lists the new production options.

7. Add these points to your diagram and draw Economainia's new *PPF*. Give two reasons for the shift in the *PPF*.

8. Given your new *PPF*, can Economainia now produce at point *H*? Please explain.

The next two questions refer to Figure 1–5, which is also Figure 1–5 in your textbook.

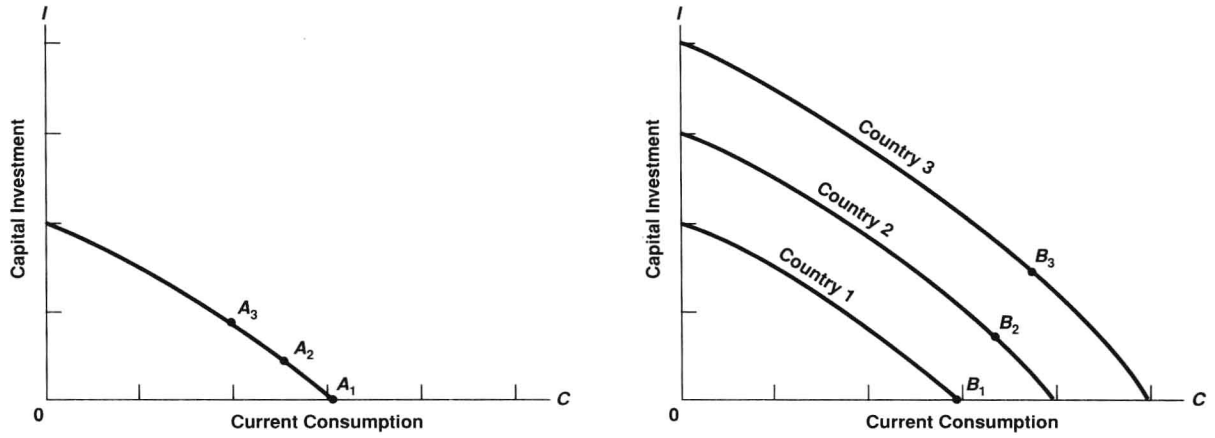

FIGURE 1–5 Investment for Future Consumption Requires Sacrificing Current Consumption

9. Explain the difference between points A_1, A_2, and A_3 in panel *(a)*.

10. What is the relationship between the three points in Figure 1–5 *(a)* and the three *PPF*s in Figure 1–5 *(b)*?

11. When an economy decides to produce more capital goods, must it usually (at least for the time being) produce fewer consumer goods? Why, or why not?

IX. ANSWERS TO STUDY GUIDE QUESTIONS

III. Review of Key Concepts

5 Scarcity
3 Efficiency
10 Free goods
8 Economic goods
1 Macroeconomics
11 Microeconomics
9 Normative economics
4 Positive economics
7 Laissez-faire economy
2 Inputs
6 Outputs

VI. Multiple Choice Questions

1. C	**2. D**	**3. A**	**4. B**	**5. A**
6. D	**7. C**	**8. E**	**9. B**	**10. B**
11. D	**12. E**	**13. B**	**14. B**	**15. A**
16. C	**17. D**	**18. B**	**19. E**	**20. C**
21. B	**22. A**	**23. B**		

VII. Problem Solving

1a. MA
b. MI
c. MA
d. MA
e. MI

2a. N
b. P
c. P
d. N
e. P
f. N

3. a, d, f.

4. tomorrow's, yesterday's

5. a, b, d.

6. (3)

7. (4)

8. (5)

9. (1)

10. (4)

VIII. Discussion Questions

1.

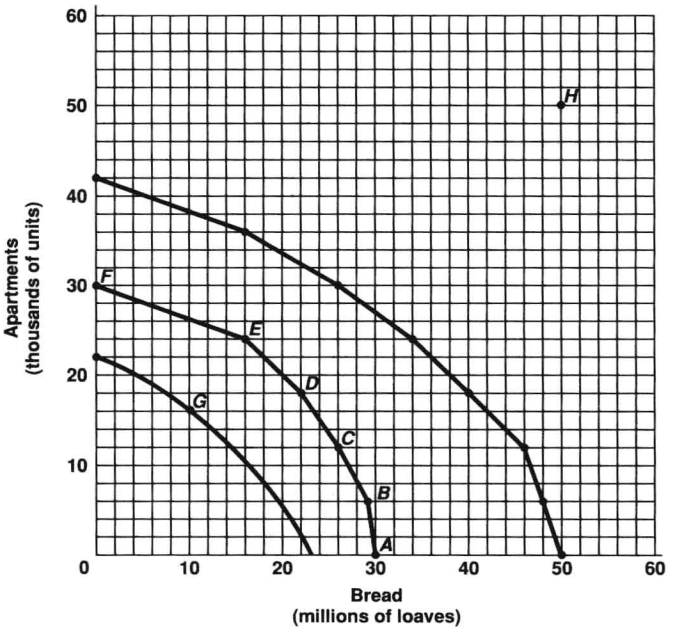

FIGURE 1–4

2. Point *C*, as well as points *A*, *B*, *D*, *E*, and *F*, all represent points of productive efficiency. Society is on its frontier. There is full employment of all resources and the only way to produce more of one good is by producing less of the other.

3. Economainia could be at *G* due to unemployment (of any resource) or some other inefficiency, such as strikes or political turmoil.

4. Since point *G* is beneath society's frontier, it represents a point of *in*efficiency—society could do better.

5. A leftward shift in the *PPF* can occur when society depletes or loses resources.

6. Point *H* is currently unattainable. Economainia has neither the resources nor the technological know-how to produce at point *H*.

7. The *PPF* may shift to the right due to advances in technology or the discovery or acquisition of more resources.

8. Point *H* is still unattainable. Society can produce either 50,000 apartments and no bread, or 50,000,000 loaves of bread and no apartments, but not both.

9. As the economy moves from A_1 to A_3, it is giving up or trading current consumption goods for capital goods. The increase in capital goods will enable this economy to produce more goods and services in the future. All the points in Figure 1–5 *(a)* represent points of full employment and efficient use of the available technology.

10. As the economy allocates more resources to capital investment in Figure 1–5 *(a)*, it is providing for more economic growth in the future. The points A_1, A_2, and A_3 represent three different choices, made by three different countries with equal resource endowments. Country 1 decides to al-

locate all its resources to current consumption. It does not grow, and the *PPF* in Figure 1–5 *(b)* is similar to the one in Figure 1–5 *(a)*. Countries 2 and 3 allocate more resources to capital investment. The more resources that are allocated to capital the more the economy grows, and the further out to the right the *PPF* shifts in the future.

11. Yes. Resources are scarce, and tradeoffs occur. While allocating more resources to capital goods will help an economy grow and produce more of both consumer and capital goods in the future, it must sacrifice some current consumption. This is not a huge problem. Since the production of capital goods is typically financed (at least in part) by saving, households send a signal to producers that they do not need consumer goods in the present. They are postponing consumption until some point in the future, when the capital investment will enable the economy to produce more.

CHAPTER 1: APPENDIX

How to Read Graphs

I. CHAPTER OVERVIEW

Economics makes extensive use of graphs and charts. They appear in nearly every chapter of the text, and the appendix to Chapter 1 in the text is included to provide the reader with a basic review of their foundation. This associated appendix extends that review.

Graphs and charts are tools with which the fundamental notions of economic reasoning can be illustrated, exercised, and stretched. Graphs provide an easy context within which to explore many economic phenomena that would otherwise require pages of prose. To proceed without a minimal understanding of graphs would be to proceed at a great disadvantage; it would be like playing defense in basketball with both hands tied behind your back.

This appendix is designed to present both a brief review of the basics of graphical analysis and some small insight into its usefulness. If you are already comfortable with graphs, you may still want to scan this appendix for a glimpse of things to come. Graphs are used in economics, most fundamentally, to illustrate how sets of numbers are related to each other.

II. LEARNING OBJECTIVES

After you have read the appendix to Chapter 1 in your text and completed the exercises in this *Study Guide* chapter, you should be able to:

1. Interpret economic relationships that are presented in diagrams and graphs.
2. Plot your own diagrams using (economic) data.
3. Evaluate the slopes of curves.
4. Understand the relationship that exists between variables that are plotted in a graph.
5. Use an equation to describe a linear relationship between two variables.

III. REVIEW OF KEY CONCEPTS

Match the following terms from column A with their definitions in column B.

A	B
___ Slope	**1.** A straight line that just touches, but does not cross, a curved line at a particular point. Used to measure the slope of the curve at that point.
___ Intercept	**2.** Indicates a direct relationship between two variables such that they both move (increase or decrease) in the same direction.
___ Origin	**3.** A diagram illustrating how a variable has changed with the passage of time. Time is measured on the horizontal axis in this diagram.
___ Positive slope	**4.** The point of intersection between a line on a diagram and the vertical axis.
___ Negative slope	**5.** Horizontal and vertical lines on a diagram that aid in plotting points.
___ *X* axis	**6.** Vertical axis on a diagram. Measurement along this axis is from bottom to top.
___ *Y* axis	**7.** The change in the variable on the vertical axis per unit of change in the variable on the horizontal axis.
___ Grid lines	**8.** A plot of pairs of points, used to visualize the relationship between two variables.
___ Tangent	**9.** Indicates an inverse or indirect relationship between two variables such that they move in opposite directions. (When one increases, the other decreases and vice versa.)
___ Scatter diagram	**10.** Horizontal axis on a diagram. Measurement along this axis is from left to right.
___ Time-series diagram	**11.** The bottom, left-hand corner, or beginning point of reference in a graph.

Note to Students Since the emphasis in this appendix is to give you practice working with graphs, we are chang-