

CHAPTER 2

Efficiency, Markets, and Government

INSTRUCTIONAL OBJECTIVES

The main objective of this chapter is to develop the concept of efficiency and show students how it is used to evaluate economic performance. To begin the discussion, it is necessary to draw the distinction between positive and normative economics. Both of these approaches are used in the chapter. An additional instructional objective is therefore to demonstrate the usefulness of each type of analysis.

The concept of efficiency is carefully linked to resource allocation and economic transactions. The chapter also introduces the student to marginal analysis of resource allocation. The distinction between total social cost and benefit, and marginal social cost and benefit is drawn for students. Graphic analysis is then used to derive the marginal conditions for efficiency. The objective is to show students that maximization of net social benefit requires that all activities be undertaken in each time period up to the point at which $MSB = MSC$.

The analysis is then used to evaluate resource allocation in competitive markets operating under conditions of perfect competition with no externalities. This is followed by examples showing how monopoly power and government intervention can result in losses in efficiency in markets. The objective here is to show how welfare triangles can be used to measure losses in well-being when efficiency is not achieved.

The equity-efficiency trade-off is also introduced in the chapter. The utility possibility curve is used to show students how citizens often rationally oppose movements to efficient resource use when compensation for losses in well-being is not actually paid. Positive analysis of the equity-efficiency trade-off is also provided, thereby closing the chapter with an illustration of how the positive approach is useful to normative analysis.

CHANGES IN THIS EDITION

- The *Public Policy Perspective* has been updated to reflect changes in the U.S. income tax code that became effective in 2018.

CHAPTER OUTLINE

Positive and Normative Economics

Normative Evaluation of Resource Use: The Efficiency Criterion

Markets, Prices, and Efficiency Conditions

Market Failure: A Preview of the Basis for Government Activity

Equity versus Efficiency

Public Policy Perspective: The Tax System and the Birthrate—An Example of Positive Economic Analysis

Positive Analysis Trade-Off Between Equity and Efficiency

MAJOR POINTS AND LECTURE SUGGESTIONS

1. Instructors may wish to emphasize the difference between the normative and positive approaches. The normative approach is based on underlying values that embody an individualistic ethic. The positive approach is simply a scientific method used to formulate hypotheses subject to empirical verification. I point out to my students that the normative approach in public finance sets up benchmarks against which the impact of government regulations, expenditures, and taxes can be evaluated.
2. There are two aspects of efficiency that are useful to emphasize in lectures:
 - a. Efficiency, as the term is commonly used by the layperson, simply means avoidance of waste in achieving any useful objective. Students are most likely already familiar with this aspect of efficiency.
 - b. The second aspect of efficiency deals with exchange. Even when production is accomplished without waste, additional net gains are usually possible through mutually agreeable exchanges.

In discussing the second aspect of efficiency, with which students are less familiar, you can point out that freedom to trade is an important aspect of efficiency. Constraints on mutually agreeable trade thereby prevent attainment of efficiency when no third parties are affected by those transactions.
3. The derivation of the marginal conditions for efficiency provides a good opportunity to review marginal analysis for students. Make sure to confine your discussion to a particular good. The example in the text uses bread. I find that students are quite receptive to the notion that net social gains are maximized when each possible good or service is made available up to the point at which $MSB = MSC$. The inclusion of the total social benefit and total social cost curves in Figure 2.1 in the text helps students see how additional production of goods is inefficient beyond the point at which $MSB = MSC$, even though $TSB > TSC$ for additional output.
4. Notice how the marginal net benefit is defined as the difference between the marginal social benefit and the marginal social cost of any given quantity of a good.
5. After deriving the efficiency conditions, I like to reinforce the theory by immediately showing students how the marginal conditions are satisfied under ideal conditions in perfectly competitive markets. In doing so, I introduce the concepts of marginal private benefit and marginal private cost. I show how $P = MPB = MPC$ in competitive markets. Finally, I set the stage for future analysis in Chapter 3 by pointing out that, provided no third parties (other than buyers and sellers) are affected by market exchanges, $P = MSB = MSC$. Because these conditions are used throughout the text, it is important for students to understand the derivation. I find that students have little difficulty with the exposition. If you get the significance of these points across early in the course, it is easy to show how taxes and subsidies prevent prices from simultaneously reflecting marginal social costs and benefits.

The numerical example in the text has been helpful to my students. Note that I use the same numbers when discussing competitive markets for bread.

6. The obvious next step is to provide your students with examples of cases for which markets *do not* achieve efficiency. The exercise of monopoly power is a good example of how lack of competition in markets can cause losses in efficiency. This example can then be supplemented with analysis of the effects of taxes and subsidies on private choices in markets. The example of target prices for agriculture in the United States shows how subsidies to agriculture result in more than the efficient amount of resources allocated to agricultural uses.

You might wish to supplement these examples with some of your own. In any case, the main instructional objective is to show students how losses in well-being resulting from inefficient output levels can be measured as triangular areas in the graphs.

The *Public Policy Perspective* shows students how the personal exemption used to be used as a subsidy to raising children and has since been replaced by the Child Tax Credit, worth up to \$2,000 per year per qualifying child under the age of 17.

7. I believe that it is important to emphasize the equity-efficiency trade-off early in the course. This provides an opportunity to show how the positive approach can be used to predict the net gains and losses to citizens. The utility possibility curve is a good tool to illustrate political conflict. First make sure that students see the similarity between the utility possibility curve and the production possibility curve. In particular, point out that the maximum possible level of well-being of any one person, given the well-being of others, depends on resources available and technology. The curve also shows how there is no one unique efficient allocation of resources. It can be used to show how the efficient outcomes of competitive interaction can result in a distribution of well-being for which many persons live in poverty.
8. I like to use the utility possibility curve to show how changes in resource allocation can result in both gainers and losers even when there is movement from inefficient to efficient resource use. Unless compensation is actually paid, the losers act to prevent the resource change that makes them worse off.

ANSWERS TO TEXT PROBLEMS

1. The marginal social benefit of the first concert is \$10,000, and its marginal social cost is \$5,000. The marginal social benefit of a second concert is \$5,000, which falls short of its marginal social cost of \$6,000. The efficient number of concerts is one. After the first concert, the marginal social cost exceeds the marginal social benefit.
2.
 - a. The efficient output is the one for which $P = MC$. If sold in a competitive market, the price of a television would be \$100 and the quantity sold would be $200,000 - 500(100) = 150,000$.
 - b. If sales were limited to 100,000 per year, the marginal social benefit of TVs would exceed the marginal social cost. Students should draw a graph showing the resulting loss of net benefits as a triangle *above* the marginal cost line and *under* the demand curve between the outputs of 100,000 and 150,000. If there is a complete ban on TV sales, the loss in net benefits will be the entire area under the demand curve and above the marginal cost curve corresponding to the consumer surplus from TV sales.
3. The senator's logic is false. Equating the marginal social benefit of a service with its marginal social cost maximizes net gains. If output is increased to the point at which $TSB = TSC$, there will be more than the efficient amount of resources devoted to space exploration.
4. The price support for rice will increase annual production beyond the efficient level. At the price support, the marginal social cost of rice will exceed its marginal social benefit.

5. At the current market equilibrium under perfect competition, $MSB = MSC = \$100$, implying efficiency. The \$10 per night tax results in an increase in the market equilibrium price of hotel rooms. At the higher prices, MSB exceeds MSC . The graph used to answer this question should be similar to Figure 2.3 in the text. The loss in net benefits would be an area like $E'EB$ in Figure 2.3.

A NOTE ON THE APPENDIX TO CHAPTER 2

The appendix to Chapter 2 sets up a two-dimensional model of efficient resource. This appendix can easily be skipped because the basic notions are developed intuitively within the chapter. If, however, you have good students, you can assign the appendix and derive the conditions in class. The standard welfare model is developed in the appendix and Edgeworth-Bowley boxes are used to derive the efficiency conditions.

OUTLINE OF THE APPENDIX TO CHAPTER 2

A Model of Efficient Resource Use

Productive Efficiency

Pareto Efficiency

Efficiency and Economic Institutions

Market Imperfections

TRUE/FALSE QUESTIONS

1. The normative approach to public finance prescribes certain actions to achieve predetermined criteria. (T)
2. Positive economic analysis is based on underlying value judgments. (F)
3. “The government should abolish tariffs to achieve efficiency” is a normative statement. (T)
4. It is possible for efficiency *not* to be attained even if all production is carried on without waste. (T)
5. Efficiency is attained when resources are used each year in such a way that no further net gain is possible. (T)
6. The efficient annual output of any given good is attained if that good is made available in amounts up to the point at which the total social benefit of the good equals the total social cost. (F)
7. If the marginal social benefit of smoke detectors exceeds its marginal social cost, then additional net gains are possible from increased annual smoke detector production. (T)
8. Monopoly power causes losses in efficiency because the marginal social benefit of output exceeds its marginal social cost at the monopoly output. (T)
9. Government regulations that require airlines to serve routes for which the maximum price that passengers are willing to pay for a trip fall short of the minimum price that sellers are willing to accept are likely to cause losses in efficiency. (T)

10. Points lying below a utility possibility curve are efficient. (F)
11. Government programs can achieve efficiency when the gains to gainers from those policies exceed the losses to those who bear the costs. (T)
12. If the marginal social cost of beer production exceeds its marginal social benefit, then more than the efficient amount of beer is being produced. (T)
13. Efficient outcomes are often viewed as inequitable. (T)
14. If it is not possible to make someone better off without harming another, then resource allocation is efficient. (T)
15. Compensation criteria are used to argue that changes in resource allocation should be made if the gains to some groups outweigh the losses to others, even though compensation for losses is not actually made. (T)
16. All points on a utility possibility curve are efficient but differ in terms of the distribution of well-being. (T)
17. A tax on a product shifts the demand curve. (F)
18. A government-subsidized price for a commodity that is higher than the market-driven price results in oversupply relative to the efficient allocation. (T)
19. When comparing the allocation of two goods relative to two consumers with individual utility functions, multiple points of Pareto efficiency can exist. (T)

MULTIPLE CHOICE QUESTIONS

1. Positive economics:
 - a. makes recommendations designed to achieve certain goals.
 - b. establishes cause-and-effect relationships between economic variables.
 - c. is based on value judgments.
 - d. can never be used to make predictions.
2. If the efficient output of a good is produced each week, then the:
 - a. marginal social benefit of the good equals its marginal social cost each week.
 - b. marginal social benefit of the good is at a maximum.
 - c. total social benefit of the good is at a maximum.
 - d. total social benefit of the good equals its total social cost.
3. If the marginal social benefit of a good exceeds the marginal social cost at the current monthly output, then:
 - a. it will be possible to make buyers of the good better off without harming sellers of the good.
 - b. it will be possible to make sellers of the good better off without harming buyers of the good.
 - c. both (a) or (b) are correct.
 - d. a reduction in monthly output will be required for efficiency.

4. The marginal social cost of bread exceeds the marginal social benefit at the current weekly output. Therefore,
 - a. the marginal net benefit of bread is positive.
 - b. the output of bread is efficient.
 - c. a reduction in weekly output of bread is necessary to achieve efficiency.
 - d. an increase in weekly output of bread is necessary to achieve efficiency.
5. The total social benefit of automobiles equals the total social cost at current annual output. It then follows that:
 - a. the annual output of automobiles is efficient.
 - b. the annual output of automobiles exceeds the efficient amount.
 - c. less than the efficient annual output of automobiles is produced.
 - d. it is not possible to make buyers of automobiles better off without harming sellers.
6. Eggs are sold in a perfectly competitive market. No persons other than the buyers and sellers of eggs are affected in any way when eggs are traded in the market. It then follows that:
 - a. the price of eggs equals the marginal social cost of eggs.
 - b. the price of eggs equals the marginal social benefit of eggs.
 - c. the price of eggs exceeds the marginal social benefit of eggs.
 - d. both (a) and (b) are correct.
7. Diamonds are sold by a monopoly firm that maximizes profits. It then follows that:
 - a. the marginal social benefit of diamonds exceeds its marginal social cost.
 - b. the marginal social cost of diamonds exceeds its marginal social benefit.
 - c. the price of diamonds equals its marginal social cost.
 - d. the price of diamonds exceeds its marginal social benefit.
8. Points on a utility possibility curve represent:
 - a. a given distribution of well-being between two persons.
 - b. an efficient allocation of resources.
 - c. the maximum well-being of any one person, given the resources available and the well-being of another person.
 - d. all of these are correct.
9. If efficiency has been attained,
 - a. it will be possible to make any one person better off without harming another.
 - b. it will not be possible to make any one person better off without harming another.
 - c. perfect competition must exist.
 - d. the opportunity cost of any change in resource use must be zero.
10. A move from an inefficient resource allocation to an efficient one:
 - a. will always be unanimously approved, even if gainers do not compensate losers.
 - b. will be unanimously opposed.
 - c. will be unanimously approved if gainers compensate losers.
 - d. can never result in losers.

11. Which of the following is a normative statement?
 - a. When interest rates rise, the quantity of loanable funds demanded for new mortgages will decline.
 - b. To achieve efficiency, governments should prevent monopoly in markets.
 - c. Unemployment increases during a recession.
 - d. When governments increase income tax rates, people work less.
12. Normative economics:
 - a. is not based on underlying value judgments.
 - b. makes recommendations to achieve efficient outcomes.
 - c. establishes cause-and-effect relationships between economic variables.
 - d. makes “if...then” type statements and checks them against the facts.
13. The extra benefit on one more unit of a good or service is its:
 - a. marginal cost.
 - b. marginal benefit.
 - c. total benefit.
 - d. total cost.
14. If the efficient output of computers is achieved this year, then market price of computers is equal to:
 - a. the marginal social benefit of computers.
 - b. the marginal social cost of computers.
 - c. the total social benefit of computers.
 - d. both (a) and (b) are correct
15. Suppose the efficient output currently prevails in the market for ice cream. A tax on ice cream consumption will:
 - a. allow efficiency to continue to prevail in the market.
 - b. result in more than the efficient output in the market.
 - c. result in less than the efficient output in the market.
 - d. cause the marginal social cost of ice cream to exceed its marginal social benefit at the market equilibrium output.
16. Positive economics is:
 - a. an equity-based approach in which income should be redistributed.
 - b. an objective approach without a particular goal based on underlying values.
 - c. a goal-oriented approach based on desired policy outcomes.
 - d. a belief that governments can implement economic policies for the greater good of society.
17. Normative economics is:
 - a. completely free of any value system.
 - b. completely objective.
 - c. based on a conscious effort to implement a particular social goal.
 - d. an approach that determines the effect of particular actions without judgment of the result being good or bad.

18. An efficient level of output means:
- a. the total social benefit less the total social cost is maximized.
 - b. the total social benefit is below the total social cost.
 - c. the total social cost equals the total social benefit.
 - d. the total social benefit less the total social cost can be improved.
19. If a government desires to increase production beyond the current competitively determined efficient level, the government should:
- a. tax the good.
 - b. subsidize the good at a price higher than its current price.
 - c. set the price below its current price.
 - d. impose a fixed fee whenever the good is purchased.
20. Pareto efficiency between two consumers is achieved:
- a. only when the individual marginal rates of substitution are equal to the marginal rate of transformation.
 - b. only when the individual marginal rates of substitution are less than one, but not necessarily equal.
 - c. only when the individual marginal rates of substitution are greater than one and equal.
 - d. only when the individual marginal rates of substitution are equal.

ESSAY QUESTIONS

1. The wine industry is currently composed of many firms, and wine is sold in a perfectly competitive market. The wine industry produces the efficient annual output of wine, which is 100,000 bottles per year. The market equilibrium price is \$5 per bottle.
 - a. Draw the market demand and supply of wine and label the curves to show why the market output is the efficient output.
 - b. Suppose that the wine industry is consolidated into one large monopoly firm. As a result of the monopolization of the industry, the price of wine increases to \$7 per bottle, and the annual quantity demanded falls to 75,000 bottles. Explain why this output is not efficient and show the loss in net benefits resulting from monopolization of the industry.
2. Explain why points on a utility possibility curve represent efficient allocations of resources. Why must the utility possibility curve be downward sloping? Draw a utility possibility curve and show how it is possible to achieve efficiency by moving from a point within the curve and the axes to a point on the curve.