7.5: Efficiency in Perfectly Competitive Markets

Learning Objectives

- Apply concepts of productive efficiency and allocative efficiency to perfectly competitive markets
- Compare the model of perfect competition to real-world markets

When profit-maximizing firms in perfectly competitive markets combine with utility-maximizing consumers, something remarkable happens: the resulting quantities of outputs of goods and services demonstrate both productive and allocative efficiency (terms that were first introduced in (Choice in a World of Scarcity)).

**Productive efficiency** means producing without waste, so that the choice is on the production possibility frontier. In the long run in a perfectly competitive market, because of the process of entry and exit, the price in the market is equal to the minimum of the long-run average cost curve. In other words, goods are being produced and sold at the lowest possible average cost.

Allocative efficiency means that among the points on the production possibility frontier, the point that is chosen is socially preferred—at least in a particular and specific sense. In a perfectly competitive market, price will be equal to the marginal cost of production. Think about the price that is paid for a good as a measure of the social benefit received for that good; after all, willingness to pay conveys what the good is worth to a buyer. Then think about the marginal cost of producing the good as representing not just the cost for the firm, but more broadly as the social cost of producing that good. When perfectly competitive firms follow the rule that profits are maximized by producing at the quantity where price is equal to marginal cost, they are thus ensuring that the social benefits received from producing a good are in line with the social costs of production.

To explore what is meant by **allocative efficiency**, it is useful to walk through an example. Begin by assuming that the market for wholesale flowers is perfectly competitive, and so \( P = MC \). Now, consider what it would mean if firms in
that market produced a lesser quantity of flowers. At a lesser quantity, marginal costs will not yet have increased as much, so that price will exceed marginal cost; that is, \( P > MC \). In that situation, the benefit to society as a whole of producing additional goods, as measured by the willingness of consumers to pay for marginal units of a good, would be higher than the cost of the inputs of labor and physical capital needed to produce the marginal good. In other words, the gains to society as a whole from producing additional marginal units will be greater than the costs.

Conversely, consider what it would mean if, compared to the level of output at the allocatively efficient choice when \( P = MC \), firms produced a greater quantity of flowers. At a greater quantity, marginal costs of production will have increased so that \( P < MC \). In that case, the marginal costs of producing additional flowers is greater than the benefit to society as measured by what people are willing to pay. For society as a whole, since the costs are outstripping the benefits, it will make sense to produce a lower quantity of such goods.

When perfectly competitive firms maximize their profits by producing the quantity where \( P = MC \), they also assure that the benefits to consumers of what they are buying, as measured by the price they are willing to pay, is equal to the costs to society of producing the marginal units, as measured by the marginal costs the firm must pay—and thus that allocative efficiency holds.

The statements that a perfectly competitive market in the long run will feature both productive and allocative efficiency do need to be taken with a few grains of salt. Remember, economists are using the concept of “efficiency” in a particular and specific sense, not as a synonym for “desirable in every way.” For one thing, consumers’ ability to pay reflects the income distribution in a particular society. Thus, a homeless person may have no ability to pay for housing because they have insufficient income.

Perfect competition, in the long run, is a hypothetical benchmark. For market structures such as monopoly, monopolistic competition, and oligopoly, which are more frequently observed in the real world than perfect competition, firms will not always produce at the minimum of average cost, nor will they always set price equal to marginal cost. Thus, these other competitive situations will not produce productive and allocative efficiency.

Moreover, real-world markets include many issues that are assumed away in the model of perfect competition, including pollution, inventions of new technology, poverty which may make some people unable to pay for basic necessities of life, government programs like national defense or education, discrimination in labor markets, and buyers and sellers who must deal with imperfect and unclear information. These issues are explored in other chapters. However, the theoretical efficiency of perfect competition does provide a useful benchmark for comparing the issues that arise from these real-world problems.

Example \( \PageIndex{1} \): A Dime a Dozen

A quick glance at Table \( \PageIndex{1} \) reveals the dramatic increase in North Dakota corn production—more than double. Taking into consideration that corn typically yields two to three times as many bushels per acre as wheat, it is obvious there has been a significant increase in bushels of corn. Why the increase in corn acreage? Converging prices.
Table \(\PageIndex{1}\): (Source: USDA National Agricultural Statistics Service)

<table>
<thead>
<tr>
<th>Year</th>
<th>Corn (millions of acres)</th>
<th>Wheat (millions of acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>91.6</td>
<td>56.82</td>
</tr>
</tbody>
</table>

Historically, wheat prices have been higher than corn prices, offsetting wheat’s lower yield per acre. However, in recent years wheat and corn prices have been converging. In April 2013, Agweek reported the gap was just \(71\) cents per bushel. As the difference in price narrowed, switching to the production of higher yield per acre of corn simply made good business sense. Erik Younggren, president of the National Association of Wheat Growers said in the Agweek article, “I don’t think we’re going to see mile after mile of waving amber fields [of wheat] anymore.” (Until wheat prices rise, we will probably be seeing field after field of tasseled corn.)

Key Concepts and Summary

Long-run equilibrium in perfectly competitive markets meets two important conditions: allocative efficiency and productive efficiency. These two conditions have important implications. First, resources are allocated to their best alternative use. Second, they provide the maximum satisfaction attainable by society.

References


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