Firms in Perfectly Competitive Markets

Chapter Outline

11.1 Perfectly Competitive Markets

Learning Objective 1  Define a perfectly competitive market, and explain why a perfect competitor faces a horizontal demand curve.

Firms in perfectly competitive markets are unable to control the prices of the goods they sell and cannot earn economic profits in the long run. A perfectly competitive market meets the conditions of (1) many buyers and sellers, (2) all firms selling identical products, and (3) no barriers to new firms entering the market.

A. A Perfectly Competitive Firm Cannot Affect the Market Price

Prices in perfectly competitive markets are determined by the intersection of market demand and supply.

Consumers and firms must accept the market price if they want to buy and sell in a competitive market. A buyer or seller who is unable to affect the market price is a price taker. Each buyer and seller in a perfectly competitive market is too small to affect the market price.

B. The Demand Curve for the Output of a Perfectly Competitive Firm

Because the firm is a price taker, it can sell as much output as it wants at the market price. Although the market demand curve has the normal downward shape, the demand curve for a perfectly competitive firm is horizontal at the market price.

11.2 How a Firm Maximizes Profit in a Perfectly Competitive Market

Learning Objective 2  Explain how a firm maximizes profit in a perfectly competitive market.
It is a reasonable to assume that the objective of a producer is to maximize profit. **Profit** is the difference between total revenue \((TR)\) and total cost \((TC)\). To maximize profit, a firm will produce that quantity of output where the difference between \(TR\) and \(TC\) is as large as possible.

### A. Revenue for a Firm in a Perfectly Competitive Market

A firm’s **average revenue** \((AR)\) is equal to total revenue divided by the number of units sold. Average revenue is also equal to the market price. **Marginal revenue** \((MR)\) is the change in total revenue from selling one more unit. For a firm in a perfectly competitive market, price is equal to both average revenue and marginal revenue.

### B. Determining the Profit-Maximizing Level of Output

The marginal revenue curve for a perfectly competitive firm is the same as its demand curve. As long as marginal revenue is greater than marginal cost, the firm’s profits are increasing and he will expand production. When marginal revenue is equal to marginal cost he will make no additional profit, so he will have maximized his profits. The profit-maximizing level of output is also where the difference between total revenue and total cost is the greatest. Since price is equal to marginal revenue for a perfectly competitive firm, it is also true that price equals marginal cost at the profit-maximizing level of output.

**11.3 LEARNING OBJECTIVE**

**11.3 Illustrating Profit or Loss on the Cost Curve Graph**

**Learning Objective 3** Use graphs to show a firm’s profit or loss.

Profit can be expressed in terms of average total cost \((ATC)\). This will allow us to show profit on a cost curve graph. Because profit equals \(TR\) minus \(TC\) and \(TR\) is price multiplied by quantity:

\[
\text{Profit} = (P \times Q) - TC
\]

If we divide both sides of this equation by \(Q\) we have:

\[
\frac{\text{Profit}}{Q} = \frac{P \times Q}{Q} - \frac{TC}{Q}
\]

or

\[
\frac{\text{Profit}}{Q} = P - ATC
\]

This equation tells us that profit per unit equals price minus average total cost. We obtain the expression for the relationship between total profit and average total cost by multiplying through by \(Q\):

\[
\text{Profit} = (P - ATC) \times Q
\]

This expression tells us that a firm’s total profit is equal to the quantity produced multiplied by the difference between price and average total cost.
A. Showing a Profit on the Graph

In a graph the firm’s profit is equal to the area of a rectangle with a height of \((P - ATC)\) and a base equal to \(Q\).

B. Illustrating When a Firm is Breaking Even or Operating at a Loss

Whether a firm makes a profit depends on the relationship of price to average total cost. There are three possibilities: (1) \(P > ATC\), which means the firm makes a profit; (2) \(P = ATC\), which means the firm breaks even; (3) \(P < ATC\), which means the firm experiences losses.

11.4 Learning Objective

11.4 Deciding Whether to Produce or to Shut Down in the Short Run

Learning Objective 4  Explain why firms may shut down temporarily.

In the short run, a firm suffering losses has two choices: (1) Continue to produce. (2) Stop production by shutting down temporarily. During a temporary shutdown, a firm must still pay its fixed costs. If, by producing, the firm would lose an amount greater than its fixed costs, it would shut down. In analyzing the firm’s decision to shut down, we assume that its fixed costs are sunk costs. A sunk cost is a cost that has already been paid and cannot be recovered. The firm should treat its sunk costs as irrelevant to its decision making. One option the firm does not have is to raise its price. If the firm did raise its price, it would lose all its customers and its sales would drop to zero.

A. The Supply Curve of the Firm In the Short Run

If the price the firm can charge drops below average variable cost, the firm will have a smaller loss if it shuts down and produces no output. So, the firm’s marginal cost curve is its supply curve for prices at or above average variable cost. Since the marginal cost curve intersects the average variable cost curve where the average cost curve is at its minimum point, the firm’s supply curve is its marginal cost curve above the minimum point of the average variable cost curve. The minimum point on the average variable cost curve is called the shutdown point. If price falls below this point, the firm shuts down in the short run.

B. The Market Supply Curve in a Perfectly Competitive Industry

11.5 Learning Objective

11.5 “If Everyone Can Do It, You Can’t Make Money at It” — The Entry and Exit of Firms in the Long Run

Learning Objective 5  Explain how entry and exit ensure that perfectly competitive firms earn zero economic profit in the long run.

In the long run, unless a firm can cover all of its costs, it will shut down and exit the industry.
A. Economic Profit and the Entry or Exit Decision

Economic profit is a firm’s revenues minus all its costs, implicit and explicit. A firm is unlikely to earn an economic profit for very long. Other firms that are just breaking even have an incentive to enter the market so they can earn economic profits. The more firms there are in an industry, the further to the right is the market supply curve. Entry into the market will continue until all firms are just breaking even. Firms can suffer economic losses in the short run. An economic loss is the situation in which a firm’s total revenue is less than its total cost, including all implicit costs. As long as price is above average variable cost, a firm suffering a loss will continue to produce in the short run. But in the long run, firms will exit an industry if they are unable to cover all their costs.

B. Long-Run Equilibrium in a Perfectly Competitive Market

Economic profits attract firms to enter an industry. The entry of firms forces down the market price until the typical firm is breaking even. Economic losses cause firms to exit an industry. The exit of firms raises the market price until the typical firm is breaking even. This process results in a long-run competitive equilibrium. Long-run competitive equilibrium is the situation in which the entry and exit of firms have resulted in the typical firm just breaking even. The long-run equilibrium price is at a level equal to the minimum point on the typical firm’s average total cost curve.

C. The Long-Run Supply Curve in a Perfectly Competitive Market

The long-run supply curve shows the relationship in the long run between market price and the quantity supplied.

D. Increasing-Cost and Decreasing-Cost Industries

Any industry in which the typical firm’s average costs do not change as the industry expands production will have a horizontal long-run cost curve. Industries where this holds true are called constant-cost industries. If an input used in producing a good is available in only limited quantities, the cost of the input will rise as the industry expands. In this case, the long-run supply curve will slope upward. Industries with upward-sloping long-run supply curves are called increasing-cost industries. In some cases, the typical firm’s costs fall as the industry expands. In this case, the long-run supply curve will slope downward. Industries with downward-sloping long-run supply curves are called decreasing-cost industries.

11.6 Perfect Competition and Efficiency

Learning Objective 6 Explain how perfect competition leads to economic efficiency.

A. Productive Efficiency

In a market system, consumers get as many apples as they want, produced at the lowest average cost possible. The forces of competition will drive the market price to the minimum average cost of the typical firm. Productive efficiency is the situation in which a good or service is produced at the lowest possible cost. Managers of firms strive to earn an economic profit by reducing costs. But in a perfectly competitive
market, other firms quickly copy ways of reducing costs, so that in the long run only consumers benefit from cost reductions.

B. Allocative Efficiency

Competitive firms not only produce goods and services at the lowest possible cost, they also produce the goods and services that consumers value most. Perfect competition achieves allocative efficiency. **Allocative efficiency** is a state of the economy in which production represents consumer preferences; in particular, every good or service is produced up to the point where the last unit produced provides a marginal benefit to consumers equal to the marginal cost of producing it. Productive efficiency and allocative efficiency are useful benchmarks against which to compare the actual performance of the economy.