

STUDY GUIDE Chapter 5, Section 1

For use with textbook pages 113–120

WHAT IS SUPPLY?

KEY TERMS

supply The amount of a product that would be offered for sale at all possible prices that could prevail in the market (page 113)

Law of Supply The principle that suppliers will normally offer more for sale at high prices and less at lower prices (page 113)

supply schedule A listing of the various quantities of a particular product supplied at all possible prices in the market (page 114)

supply curve A graph showing the various quantities supplied at each and every price that might prevail in the market (page 114)

market supply curve The supply curve that shows the quantities offered at various prices by all firms that offer the product for sale in a given market (page 114)

quantity supplied The amount that producers bring to market at any given price (page 115)

change in quantity supplied The change in amount offered for sale in response to a change in price (page 115)

change in supply A situation where suppliers offer different amounts of products for sale at all possible prices in the market (page 116)

subsidy A government payment to an individual, business, or other group to encourage or protect a certain type of economic activity (page 117)

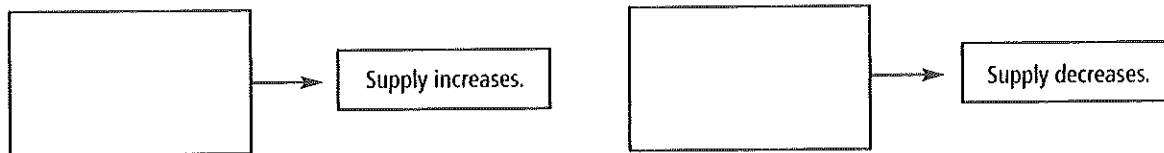
supply elasticity A measure of the way in which quantity supplied responds to a change in price (page 118)

DRAWING FROM EXPERIENCE

Have you ever gone to a store to buy something, only to find out that the store had sold out its supply of the item? What did you do? This section focuses on supply in the marketplace and how economists measure it.

ORGANIZING YOUR THOUGHTS

Use the diagram below to help you take notes as you read the summaries that follow. Think about how different factors affect supply.



STUDY GUIDE (continued) **Chapter 5, Section 1**

Introduction (page 113)

Supply is the amount of output (product) that producers will bring to market at each and every price. The **Law of Supply** states that the amounts of product offered for sale change depending on its price. If prices are high, suppliers will offer more amounts for sale. If prices are low, they will offer lesser amounts for sale.

1. In which case will a toymaker offer more fashion dolls: if the company can charge \$20 for each doll, or if it can charge \$10 for each doll? Explain your answer.

An Introduction to Supply (page 113)

Supply can be represented in a **supply schedule**, which is a list of different amounts of a product that the manufacturer supplies at all prices that are possible. Supply can also be represented as a **supply curve**—a graph showing the various amounts that a producer supplies at each and every price that might prevail at the market. The **market supply curve** shows the amount of the product offered at different prices by all the companies that sell the product.

2. How do a supply curve and a market supply curve differ?

Change in Quantity Supplied (page 115)

The **quantity supplied** is the amount of a product that the producers offer for sale at any specific price. The change in the amount of product offered for sale in response to a price change is called **change in quantity supplied**. In general, if the price of a product goes up, the producer offers more of the product for sale.

3. What causes a change in the quantity of a product that is supplied?

STUDY GUIDE (continued) **Chapter 5, Section 1**

Change in Supply (page 116)

A **change of supply** is a change of the quantity that will be supplied at each and every price. Although a change in quantity supplied is caused by a price change, a change in supply—whether a decrease or an increase—is caused by several other reasons. Inputs are the materials and labor needed to make the product. If the cost of inputs drops, then the supply of a product increases. If the price of inputs increases, then the supply decreases. If management makes workers want to work harder, the supply increases. If workers are unhappy, the supply usually decreases.

New technology tends to decrease the cost of production, because newer machinery makes products better and more quickly than the old technology. This increases supply. If firms are taxed, it costs more for them to make products, and their supply decreases. A **subsidy** is payment that a government gives to a business to help the business. If a firm receives a subsidy, the extra money helps it increase its supply of product.

If producers expect a price to go up, they may decrease the supply for now. If they expect a price slump, they increase the supply while the price is still high. When the government makes businesses obey strict rules, the supply generally decreases because it becomes harder for firms to produce goods. Fewer government rules usually mean an increase in supply. If more firms produce a product, the supply goes up. If the number of firms decreases, the supply decreases too.

4. Do you think the supply of handmade clothing in the market is larger or smaller than the supply of machine-made clothing? Explain your answer.

Elasticity of Supply (page 118)

Supply elasticity is a measurement of the effect of price change on the amount of a product that the maker supplies. A product has an elastic supply if, when its selling price increases, its supply increases quickly by a large amount. If the firm that makes the product can quickly increase its production, then the supply is likely to be elastic. If the production takes a long time to adjust, then the supply is generally inelastic.

5. Which firm is more likely to have an elastic supply—a candy producer or a shale oil producer? Explain your answer.

STUDY GUIDE Chapter 5, Section 2

For use with textbook pages 122–125

THE THEORY OF PRODUCTION

KEY TERMS

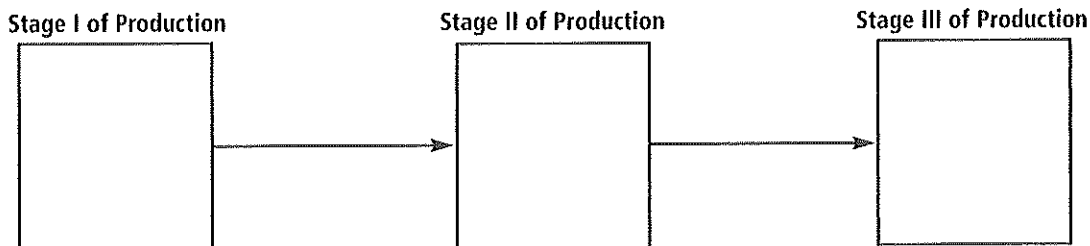
- theory of production** The relationship between factors of production and the output of goods and services (page 122)
- short run** A period of production that allows producers to change only the amount of the variable input called labor (page 122)
- long run** A period of production long enough for producers to adjust the quantities of all its resources, including capital (page 122)
- Law of Variable Proportions** In the short run, output will change as one input is varied while the others are held constant (page 122)
- production function** A concept that describes the relationship between changes in output to different amounts of a single input while other inputs are held constant (page 123)
- raw materials** Unprocessed natural products used in production (page 123)
- total product** Total output produced by a firm (page 123)
- marginal product** The extra output or change in total product caused by the addition of one more unit of variable input (page 124)
- stages of production** Increasing returns, diminishing returns, and negative returns (page 125)
- diminishing returns** The stage where output increases at a diminishing rate as more units of a variable are added (page 125)

DRAWING FROM EXPERIENCE

Have you ever worked at a summer job with a lot of other students? When you and the other students quit your jobs at the end of the summer, how was the business's output affected? In the last section, you read about what supply is. This section focuses on the theory of production.

ORGANIZING YOUR THOUGHTS

Use the flow chart below to help you take notes as you read the summaries that follow. Think about what happens in each different stage of production.



STUDY GUIDE (continued) **Chapter 5, Section 2**

READ TO LEARN

Introduction (page 122)

The **theory of production** explains how the factors of production (land, capital, labor, and entrepreneurship) are related to the amount of goods and services that are produced. The theory of production is generally based on the **short run**, which is a short production period. The time is so short that only one variable input—labor—changes. (A variable input is a kind of input that can be changed, such as labor, supply of materials, and amount of money that can be spent on new machinery.) In contrast, the **long run** is a production period that is long enough to adjust the amounts of all resources, including capital goods.

1. Why would changing capital goods be difficult in the short run?

Law of Variable Proportions (page 122)

The Law of Variable Proportions states that in the short run, the amount of a product that is produced will change if one kind of input changes while the other kinds of input stay the same. A farmer, for example, uses the law to find out how a crop yield will be affected if different amounts of fertilizer are added, but the farm machinery and the size of the field stay the same. Economists do not like to change more than one factor at a time because then it becomes difficult to study the effect of a single variable on total output.

2. Suggest how a factory manager might use the Law of Variable Proportions.

The Production Function (page 123)

The relationship between changes in output and changes in a single input is called a **production function**. For example, a production function may show that one worker produces seven units of output, two workers produce 20 units, and so on. The only thing that changes is the number of workers. Other kinds of input, including raw materials, stay the same. **Raw materials** are the materials used in production, such as wood, cotton, iron, and rubber.

As more workers are added, production rises. However, after even more workers are added, production does not rise as fast. And if too many workers are added, production can even go down, because the workers get in each other's way.

The two most important measures of output are total product and marginal product. **Total product** is the total amount of a product that is produced by a business. **Marginal product** is the extra output produced when one input, such as one more worker or one new machine, is added.

STUDY GUIDE (continued) **Chapter 5, Section 2**

- 3. Based on the production function discussed above, what was the marginal output when a second worker was added? How did you get this number?

☐ Three Stages of Production (page 125)

The three **stages of production** are based on changes in marginal product as the number of workers increases. During Stage I, when there are few workers, each new worker hired contributes more to the total output than the worker before. In other words, if two workers can produce 10 units of product, then three workers might be able to produce 20 units. That happens because new workers are needed so that the machinery and other resources can be used well. The increase in productivity during this stage is called increasing returns. (*Returns* refers to total production.)

During Stage II the total production continues to grow with each new worker. However, it grows by smaller and smaller amounts with each new hired worker. Suppose, in the example described above, a fourth worker is hired, and the total output becomes 27 units. While the third worker added 10 units, the fourth only added seven. This occurrence is called **diminishing returns**. In Stage III, the firm has hired too many workers; they get in one another's way. At this point, marginal product actually decreases each time a new worker is added. So total factory output decreases.

- 4. Suppose the last worker hired increases a factory's production from 28 units to 30 units. The next-to-last worker hired increased production from 20 units to 28. In what stage of production is the factory? Explain your answer.

STUDY GUIDE Chapter 5, Section 3

For use with textbook pages 127–131

COST, REVENUE, AND PROFIT MAXIMIZATION

KEY TERMS

- fixed cost** The cost that a business incurs even if the plant is idle and output is zero (page 127)
- overhead** Total fixed cost (page 127)
- variable cost** A cost that changes when the business rate of operation or output changes (page 128)
- total cost** The sum of the fixed and variable costs (page 128)
- marginal cost** The extra cost incurred when a business produces one additional unit of a product (page 129)
- e-commerce** Electronic business or exchange conducted over the Internet (page 129)
- total revenue** The number of units sold multiplied by the average price per unit (page 130)
- marginal revenue** The extra revenue associated with the production and sale of one additional unit of output (page 130)
- marginal analysis** A type of cost-benefit decision making that compares the extra benefits to the extra costs of an action (page 131)
- break-even point** The total output or total product the business needs to sell in order to cover its total costs (page 131)
- profit-maximizing quantity of output** The situation that exists when marginal costs and marginal revenue are equal (page 131)

DRAWING FROM EXPERIENCE

Have you ever set up a lemonade stand? If so, how much did it cost you to start? Did you make at least enough in sales to cover the cost of sugar, lemons, paper cups, and other materials? In the last section, you learned about the different stages of production. In this section you will learn about the different measures of cost and how this affects revenue.

ORGANIZING YOUR THOUGHTS

Use the table below to help you take notes as you read the summaries that follow. Think about different examples of measures of cost.

Measure of Cost	Example
Fixed cost	
Variable cost	
Marginal cost	

STUDY GUIDE (continued) **Chapter 5, Section 3**

READ TO LEARN

Measures of Cost (page 127)

The cost that a business has to pay even if a factory is unused and output is zero is called **fixed cost**. Fixed cost includes such things as interest payments on debts, rents, and taxes. It also includes depreciation, which is a measurement of the decreasing value of capital goods, such as machinery, as they are used over and over again. Total fixed cost is called **overhead**.

Unlike fixed costs, some costs can change as the amount of production changes. Such a cost is called a **variable cost**. An example of a variable cost is the cost of the electric power to run machines. If the machines are not running, there is no cost for electricity. But when the machines are being used, the business has to pay for the electricity to run them. The sum of the fixed and variable costs is the **total cost**. **Marginal cost** is increase in variable costs that comes from using additional factors of production.

1. A farmer has to pay rent for a warehouse in which to store peaches that have just been picked. The farmer has to pay this rent even during the winter, when there are no peaches in the warehouse. Is the rent a fixed cost or a variable cost? Explain.

Applying Cost Principles (page 129)

Inputs affect production because different input have different costs, and inputs can be combined in different ways. For example, a gas station is likely to have large fixed costs, such as the cost of the lot and taxes. The variable costs are probably small, such as employee wages and the cost of electricity. Because of this, the owner might be able to keep the gas station open 24 hours a day for a fairly low cost. Since the variable costs are small, they may be covered by the profits of the extra sales.

An **e-commerce** business is a business that operates on the Internet. It does not have to pay rent or have a large supply of goods because customers visit the store on the Web and look at "virtual" merchandise. Thus, fixed costs are very low.

2. Explain why it is worthwhile to keep a theater open during the afternoon, at a time when there are fewer customers than in the evening.

STUDY GUIDE (continued) **Chapter 5, Section 3**

Measures of Revenue (page 130)

Total revenue is the number of outputs or products sold, multiplied by the average price for each product. **Marginal revenue** is the extra revenue gained from the sale of each additional unit of output. You can figure out marginal revenue by dividing the change in total revenue by the marginal product.

3. Explain the difference between total revenue and marginal revenue.

Marginal Analysis (page 131)

Economists use **marginal analysis**, which compares the extra benefits to the extra costs of an action. Marginal analysis helps in finding the **break-even point**—the total product the business needs to sell in order to cover its costs. It also helps a business figure out the **profit-maximizing quantity of output**. This is the point at which marginal cost is equal to marginal revenue.

4. Suppose a business pays its workers a total of \$10,000 a year. Last year, the business earned \$9,765. Has the business reached the break-even point? Explain.
