

The Market at Work: Supply and Demand

ECO 304K: Introduction to Microeconomics

Buyers and Sellers together determine the price of the good

Sometimes buyers set the price — through live auctions, on eBay, or at shopgoodwill.com; other times, sellers set the price and how much inventory remains. Buyers and sellers influence both prices and quantities traded, so that these end up being determined by how buyers' and sellers' price-versus-quantity calculations interact.

This chapter describes how markets work and discusses the nature of the competition; to shed light on the process, we introduce the formal model of demand and supply. We begin by looking at demand and supply, then we combine them to see how they interact to establish the market price and determine how much is produced and sold.

Core questions

- What are the fundamentals of markets?
 - A market consists of a group of buyers and sellers for a particular product or service
 - A competitive market exists when there are so many buyers and sellers that each has only a small (negligible) impact on the market price and output.
 - Not all market are competitive. When firms have market power, markets are imperfect.
- What determines demand?
 - The law of demand states that, all other things being equal, quantity demanded falls when the price rises, and rises then the price falls.
 - The demand curve is downward sloping
 - A price change causes a movement along the demand curve, not a shift of the curve
 - Changes in something other than price (including changes in income, the price of related goods, changes in taste and preferences, price expectations, the number of buyers, and taxes) shift the demand curve.
- What determines supply?

- The law of supply states that, all other things being equal, the quantity supplied of good rises, and falls when the price of the good falls.
- The supply curve is upward sloping
- A price change causes movement along the supply curve, not a shift of the curve
- Changes in something other than price (costs of inputs, changes in technology or the production process, taxes and subsidies, the number of firms in the industry, and price expectations) shift the original supply curve.
- **How do supply and demand interact to create equilibrium?**
 - Supply and demand work together in a market-clearing process that leads to equilibrium, the balancing point between two forces. The market-clearing price and output are determined at the equilibrium point.
 - When the price is above the equilibrium point, a surplus exists, and inventories build up. Suppliers lower their price in an effort to sell the unwanted goods. The process continues until the equilibrium price is reached
 - When price is below the equilibrium point, a shortage exists, and inventories are depleted. Suppliers raise the price until the equilibrium point is reached.

What are the Fundamentals of Markets?

Markets bring trading partners together to create order out of chaos. Companies supply goods and services, and customers want to obtain those goods and services that the companies supply. In a **market economy**, resources are allocated among households and firms with little or no government interference.

Adam Smith, the founder of modern economics, described the dynamic best: *"It is not from the benevolence of the butcher, the brewer, or the baker, that we expect our dinner, but from their regard to their own interest."* In other words, producers earn a living by selling products consumers want. Consumers are also motivated by self-interest; they must decide how to use their money to select goods they need or want the most. This process, which Adam Smith called the **invisible hand**, guides resources to their highest value use. The exchange of goods and services in a market economy happens through prices that are established in markets.

Why does all of this happen? Supply and demand tell the story; we begin our exploration of supply and demand by looking at where they interact — in markets. A firm's degree of control over the market price is the distinguishing feature between **competitive markets** and **imperfect markets**.

Competitive Markets

Buyers and sellers of a specific good or service come together to form a market. Formally, a **market** is a collection of buyers and sellers of a particular product or service; the buyers create the demand for the product, while sellers produce the supply. The interaction of the buyers and sellers in a market establishes the price and the quantity produced of a particular good or the amount of a service offered.

Markets exist whenever goods and services are exchanged. Some markets are online and other operate in traditional “brick & mortar” stores. **A competitive market** is one in which there are so many buyers and sellers that each has only a small impact on the market price and output. In fact, the impact is so small that it is negligible; because each buyer and seller is just one small part of the whole market, no single buyer or seller has any influence over the market price. These two characteristics — similar goods and many participants — create a highly competitive market in which the price and quantity sold of a good are determined by the market rather than by one person or business.

Imperfect Markets

Markets are not always fully competitive; British economist Joan Robinson wrote that in imperfect competition, *“a certain difficulty arises [because] the individual demand curve for the product of each of the firms...will depend to some extent upon the price policy of the others.”* Accordingly, we define these **imperfect markets** as markets in which either the buyer or the seller can influence the market price.

When the seller has some control over the price, we say that the market is **imperfect**. Specialized products, such as popular video games, front-row concert tickets, or dinner reservations at a trendy restaurant, give the seller substantial pricing power. **Market power** is a firm’s ability to influence the price of a good or a service by exercising control over its demand, supply or both.

A monopoly exists when a single company supplies the entire market for a particular good or service; but even in imperfect markets, the forces of supply and demand significantly influence producer and consumer behavior. (For the time being we’ll keep our analysis focused on supply and demand in a competitive market(s).

What determines demand?

Demand exists when an individual or group wants something badly enough to pay or trade for it. How much an individual or group actually buys depends on the price of the good or service.

In economics, the amount of a good or service that buyers are willing and able to purchase at the current price is known as the **quantity demanded**.

When the price of a good increases, consumers often respond by purchasing less of the good or buying something else. Therefore, as price goes up, quantity demanded goes down; similarly, as price goes down, quantity demanded goes up. This negative (opposite) relationship between price and the quantity demanded is **the law of demand**. **The law of demand** states that, all other things equal, the quantity demanded falls when the price rises when the price falls. **The law of demand** holds true over a wide range of goods and settings.

Market Demand

So far, we have studied individual demand, but a market is composed of many different types of buyers. In this section, we examine the collective demand of all the buyers in a given market. The **market demand** is the sum of all individual quantities demanded by each buyer in a market at each price. Any demand curve shows the law of demand with movements along (up or down) the curve that reflect the effect of a price change on the quantity demanded of the good or service. Only a change in price can cause a movement along a demand curve.

Shifts in the demand curve

We have examined the relationship between price and quantity demanded. This relationship, described by the law of demand, shows us that when price changes, consumers respond by altering the amount they purchase; but in addition to price, many other variables influence how much of a good or a service is purchased. For instance, news about the possible risk(s) or benefit(s) associated with the consumption of a good or service can change overall demand.

Furthermore, many different variables can shift the demand; these include changes in buyers' income, the price of related goods, changes in buyers' taste and preferences, price expectations, the number of buyers, and taxes. The easiest way to keep all of these elements straight is to ask yourself a simple question: **Would this change cause me to buy more or less of the good?** If the change reduces how much you would buy at any given price, you shift the demand curve to the left; if the change increases how much you would buy at any given price, you shift the curve to the right.

Changes in Buyer's income

When your income goes up, you have more to spend. Assuming that prices don't change, individuals with higher incomes are able to buy more of what they want. Similarly, when your income declines, **your purchasing power**, or how much you can afford, falls; in either case, your income affects your overall demand.

When economists look at how consumers spend, they often differentiate between two types of goods: normal and inferior. Consumers will buy more of a **normal good** as their income goes up (assuming all other factors remain constant — *ceteris paribus*). While consumers with an increased income may purchase more of some things, the additional purchasing power will mean they purchase fewer inferior goods. **An inferior good** is one where demand declines as income rises...as income goes up, consumers buy less of an inferior good because they can afford something better. Within a specific product market, you can often find examples of inferior and normal goods in the form of different brands

The Price of Related Goods

Another factor that can shift the demand curve is the price of related goods. Certain goods directly influence the demand for other goods. **Complements** are two goods that are used together; **substitutes** are two goods that are used in place of each other.

Changes in tastes and preferences

While something is popular, demand increases; as soon as it falls out of favor, you can expect demand for it to decrease. Tastes and preferences can change quickly, and this fluctuation alters the demand for a particular good. Though changes in fashion trends are usually purely subjective, other changes in preferences are the result of new information about the goods and services we buy.

Price expectations

Expectations about the future influenced your current demand. If we expect a price to be higher tomorrow, we are likely to buy more today to beat the price increase; the result is an increase in current demand. Likewise, if you expect a price to decline soon, you might delay your purchase to try to get a lower price in the future. An expectation of a lower price in the future will therefore decrease current demand.

The number of buyers

Recall that the market demand curve is the sum of all individual demand curves. Therefore, another way for market demand to increase is for more individual buyers to enter the market. In other words, demographics changes in society are another source of shifts in demand. In many markets, ranging from movie theater attendance to home ownership, population trends play an important role in determining whether the market is expanding or contracting.

Taxes and subsidies

Changes in **excise taxes** (which are taxes on a single product or service) and **sales taxes** (which are general taxes on most goods and services) affect demand as well.

Higher tax in addition to the price they pay for the good. Lower taxes reduce the overall cost to consumers and therefore increase demand. The reverse is true for a **subsidy**, which is a payment made by the government to encourage the consumption or production of a good or service. A lot of times it's a tax break, like mortgage interest tax deduction, or tax credits on eco-friendly cars. In both cases, the tax break encourages consumers to purchase more of the subsidized good.

What determines supply?

Even though we have learned a great deal about demand, our understanding of markets is incomplete without also analyzing supply. We have seen that with demand, price and output are **negatively related**; that is, they move in opposite directions. With supply, however, the price level and quantity supplied is **positively related**; that is, they move in the same direction. **The quantity supplied** is the amount of a good or service that producers are willing and able to sell at the current price. Higher prices cause the quantity supplied to increase; conversely, lower prices cause the quantity supplied to decrease.

When price increases, producers often respond by offering more for sale; as price goes down, quantity supplied also goes down. This direct positive relationship between price and quantity supplied is the **law of supply**; it states that, all other things being equal, the quantity supplied increases when the price rises, and the quantity supplied falls when the price falls. This law holds true over a wide range of goods and settings.

The Supply Curve

A **supply schedule** is a table that shows the relationship between the price of a good and the quantity supplied. A supply curve is a graph of the relationship between the prices in the **supply schedule** and the quantity supplied at those prices.

Market Supply

The **Market supply** is the sum of the quantities supplied by each seller in the market at each price.

Shifts of the supply curve

When a variable other than the price changes, the entire supply curve shifts; an increase in supply shifts the supply curve to the right, but that happens when a variable causes supply to decrease? This decrease in supply shifts the supply curve to the left. Many variables can shift supply, but it also reminds us of what **does not** cause a shift in supply: **the price**. Recall that price is the variable that cause the supply curve to slope upward; **a price change causes a movement along the supply curve, not a shift in the curve**.

Factors that shift the supply curve include the cost of inputs, changes in technology or the production process, taxes and subsidies, the number of firms in the industry, and price expectations. The easiest way to keep them straight is to ask yourself a simple question: Would the change cause a business to produce more of the good or less of the good? If the change would reduce the amount of a good or service a business is willing and able to supply at every given price, the supply curve shifts to the left. If the change would increase the amount of a good or service a business is willing and able to supply at every given price, the supply curve shifts to the right.

The Cost of Inputs

Inputs are resources used in the production process. Inputs may include workers, equipment, raw materials, buildings, and capital goods. Each of these resource are critical to the production process. When the cost of inputs changes, so does the seller's profit; if the cost of inputs declines, the profits improve. Improved profits make the firm more willing to supply the good; conversely, higher input costs reduce profits.

Changes in technology or the production process

Technology encompasses knowledge that produces use to make their products; an improvement in technology enables a producer to increase output with the same resources or to produce a given level of output with fewer resources. If the producers of a good discover a new and improved technology or a better production process, there will be an increase in supply. That is, the supply curve for the good will shift to the right.

Taxes and Subsidies

Taxes placed on suppliers are an added cost of doing business. For example, if property taxes are increased, the cost of doing business goes up. A firm may attempt to pass along the tax to the consumers through higher prices, but higher prices will discourage sales. So, in some cases, the firm will simply have to accept the taxes as an added cost of doing business, either way, a tax makes the firm less profitable. Lower profits make the firm less willing to supply the product; thus, the supply curve shifts to the left and the overall supply declines.

The reverse is true for **a subsidy**, during the COVID-19 pandemic, hospitals received federal subsidies to offset the added costs associated with treating infected patients (more tests, more protective gear, more sterilizing of equipment, more laundry, and so on...) In addition, airlines and small businesses received subsidies to keep workers employed while the lockdown prevented people from traveling and from going about their day-to-day business at work. As a result, more essential workers remained employed, compared to what would have happened without the subsidies.

The number of firms in the industry

We saw that an increase in total buyers (population) shifts the demand curve to the right. A similar dynamic happens with an increase in the number of sellers in an industry. Each additional firm that enters the market increases the available supply of a good. In graphic form, the supply curve shifts to the right to reflect the increased production. By the same reasoning, if the number of firms in the industry decreases, the supply curve shifts to the left. Changes in the number of firms in a market are a regular part of business.

Price expectations

A seller who expects a higher price for a product in the future may wish to delay sales until a time when the product will bring higher price. Likewise, the expectation of lower prices in the future will cause sellers to offer more while prices are still relatively high. This effect is particularly noticeable in the electronics sector, where newer — and much better — products are constantly being developed and released. Sellers know that their current offerings will soon be replaced by something better and that consumer demand for the existing technology will then plummet. This means that prices typically fall when a product has been on the market for a time; because producers know that the price will fall, they supply as many of the current models as possible before the next wave of innovation cuts the price they can charge.

How do Supply and Demand interact to create Equilibrium?

We have examined supply and demand separately. Now it is time to see how the two interact; the real power of supply and demand analysis is in how well it predicts prices and output in the entire market.

Supply, Demand, Equilibrium

The point of equilibrium is where the demand curve and the supply curve intersect. At this point, the two opposing forces of supply and demand are perfectly balanced. The equilibrium price is the quantity supplied that equals to the quantity demanded; it is also called **market-clearing price**, because that is the only price at which no surplus or shortage of the goods exists. Similarly, there's also an equilibrium quantity at which the quantity supplied equals the quantity demanded; when the market is in equilibrium, we sometimes say that **the market clears** or that **the price clears the market**.

The equilibrium point has a special place in economics because movements away from that point throw the market out of balance. The equilibrium process is so powerful that it is often referred to as the law of supply and demand, *the idea that the market prices adjust to bring the quantity supplied and quantity demanded into balance.*

Shortage and Surpluses

When there is more demand for a product than sellers are willing or able to supply, we say there is a shortage. A shortage, or **excess demand**, occurs whenever the quantity supplied is less than the quantity demanded. A surplus, or **excess supply**, occurs whenever the quantity supplied is greater than the quantity demanded.

Every seller and buyer has a vital role to play in the market, venues like the Pike Place Market bring buyers and sellers together. Amazingly, market equilibrium occurs without the need for government planning to ensure an adequate supply of the goods consumers want or need; you might think that a decentralized system would create chaos, but nothing could be further from the truth. Markets work because buyers and sellers can rapidly adjust to changes in prices, these adjustments bring balance; when market were suppressed in communist countries during the 20th century, shortages were commonplace, in part because there was no market price system to signal that additional production was needed.

In Appendix 3A, we consider what happens when supply and demand change at the same time. There you will discover the challenges in simultaneously determining price and quantity when more than one variable changes.

Conclusion

Five years from now, if someone ask you what you remember about your first course in economics, you'll probably respond with two words: "supply" and "demand". These two forces allow us to model market behavior through prices. Supply and demand help establish the market equilibrium, or the prices at which quantity demanded are in balance. At the equilibrium point, every good and service produced has a corresponding buyer who wants to purchase it. When the market is out of equilibrium, either a shortage or surplus exists. This condition persists until buyers and sellers have a chance to adjust the quantity they demand and the quantity they supply, respectively

In the next chapter, we extend our understanding of supply and demand by examining how sensitive, or responsive, consumers, and producers are to price changes. With this knowledge, we can determine whether price changes have a big effect on behavior or not.