Chapter 4
Supply and Demand

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Macroeconomics in Context, Goodwin, et al.
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Chapter 4: Supply and Demand

The on-line auction site eBay has more than 181 million users. Every second, $1,373 worth of products—recreational vehicles, flat-screen televisions, commemorative coins, t-shirts, condominiums, you name it—are traded. From its beginnings in the United States in 1995, eBay has grown into a global marketing service for individuals and small businesses. Perhaps you have bought or sold something on eBay. If you have, then you have had direct experience with a real world market very similar, in some ways, to the sort of idealized market that forms the basis for economists’ theory of supply and demand.

1. Markets and Macroeconomics

As we discussed in Chapter 2, markets are places where individuals, businesses, and other organizations engage in buying and selling. The economic theory of supply and demand is an exceptionally useful example of a “thought experiment” that seeks to describe, in abstract terms, how people make their decisions about buying and selling.

The theory provides an elegant, simple picture of how potential sellers decide how much of a good or service to offer to sell (supply) on a market, and how potential buyers decide how much to purchase (demand). The theory then goes on to show how a market, when it functions in a smooth, idealized way, coordinates these decisions.

The real world sometimes works pretty much as the theory predicts; at other times there are other forces that push decisions, and prices, away from the result predicted in the theory. When the real world is behaving according to the theory, the result is that “the market”—not any particular individual agent or bureaucracy—determines the number of units of a good or service that are actually sold on a market, and the price at which the units sell.

1.1 Classicals and Keynesians

The direct study of actual markets is more of a microeconomic topic than a macroeconomic one, as we defined these terms in Chapter 1. One reason we particularly need to introduce (or review, for those of you who have taken microeconomics) the model of supply and demand here is that understanding this model is crucial for understanding the classical approach to macroeconomics. Classical macroeconomists tend to believe that markets generally function smoothly, as portrayed in this model—at least as long as governments don’t interfere.

Keynesian economists, on the other hand, tend to believe that market economies need more help from government policies. They agree that the model of supply and demand has an important role to play in economics, but claim that understanding the workings of the macroeconomy requires that one go beyond this model, for two reasons.
First, real world markets may deviate in important ways from the one portrayed in the abstract model. Second, explaining economic phenomena at the national level may require a different set of theoretical tools than tools designed for analyzing individual markets for particular goods.

The first four sections of this chapter lay out the basic supply and demand model. In the last section, we return to the question of how this model sometimes may be, and sometimes may not be, helpful in understanding macroeconomics.

1.2 A Particular Kind of Market

The sort of market imagined in the Classical world has three noteworthy characteristics. It is envisioned as:

1. **perfectly competitive**. In a perfectly competitive market, there many buyers and sellers of a good, all units of the good are identical, anyone can enter or leave the market at will, and everyone has perfect information.
2. **spot**. A spot market is a market for immediate delivery of a good or service.
3. **double auction**. An auction market is a market where an item is sold to the highest bidder. In a double auction, both buyers and sellers state prices at which they are willing to make transactions.

eBay, for example, is a pretty good real-world example of an auction market in which there are many buyers and sellers. You have experienced other kinds of markets, as well, however. If you want to buy the Microsoft Windows operating system, for example, while retailers may vary their prices by a dollar or two, the sole ultimate supplier is Microsoft. The computer operating system market is far from perfectly competitive. If you sign a contract for a year’s lease on an apartment, you are making a long-term agreement to buy housing services over an extended period of time. Markets for rental housing are examples of markets that are not “spot.” Or if you go into a retail clothing store in the United States to buy a shirt, you pay the price on the tag. You will be considered to be acting strangely if you attempt to get the sales assistant to accept a lower bid. Retail stores don’t operate on an auction basis.

| **perfectly competitive market**: a market in which there are many buyers and sellers, all units of the good are identical, and there is free entry and exist and perfect information |
| **spot market**: a market for immediate delivery |
| **double auction market**: a market in which both buyers and sellers state prices at which they are willing to make transactions, and the item is sold to the highest bidder |

Many of the controversies in macroeconomics come down to a question of the degree to which real-world markets—and, in particular, real-world labor markets and
financial markets—are similar to, or differ in important ways from, the perfectly competitive, spot, double auction markets assumed in basic market theory.

Discussion Questions

1. Have you ever traded on eBay or a similar internet auction site? If you have, describe to your classmates how it works.

2. Think about a case recently where you exchanged money for some good or service. Was that market “perfectly competitive”? Was it a “spot” market? Was it a “double auction” market?

2. The Theory of Supply

We will start with the following thought experiment. Suppose there is a condominium apartment building where all the apartments are identical, and each apartment has a different owner. Suppose that a number of them might be interested in selling their apartments. For the purposes of this thought experiment, we will assume that they are all well-informed and interested primarily in their potential monetary gain.

Each owner has a slightly different idea of what would be an acceptable price. No owner will accept less than $91,000 for his or her apartment. At a price of $91,000, one owner is willing to sell. At a price of $92,000, two owners are willing to sell. In fact, it turns out that each time the price rose by $1,000 there is one more owner willing to sell an apartment. None would be willing to sell at $90,000.

2.1 The Supply Schedule and Curve

The result of this pattern is the schedule that is shown in Table 4.1, which we call a supply schedule. A supply schedule shows us, in the form of a table, the quantity of a good or service that would be offered by the sellers at each possible price.

<table>
<thead>
<tr>
<th>Price ($1000s)</th>
<th>100</th>
<th>99</th>
<th>98</th>
<th>97</th>
<th>96</th>
<th>95</th>
<th>94</th>
<th>93</th>
<th>92</th>
<th>91</th>
<th>90</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity of Apartments Supplied</td>
<td>10</td>
<td>9</td>
<td>8</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

From the supply schedule, we can graph a supply curve, as shown in Figure 4.1, which shows the same information in a different form.¹ If we ask how many apartments will be offered for sale at a price of $96,000, for example, we can look across from

¹ Unlike the graph we drew in Chapter 2 based on time series data, here our (made-up) “data” are what are called cross-section data. That is, the “data” show various values for the variables (price and quantity) all measured at a single point in time. Note that, for ease in presentation, we have started the vertical axis in Figure 4.1 at a number other than zero.
$96,000 on the vertical (price) axis over to the supply curve, and then drop down to the horizontal (quantity) axis to find that the answer is 6.

**supply curve**: a curve indicating the quantities that sellers are willing to supply at various prices

![Supply Curve](image)

**Figure 4.1 The Supply Curve for Apartments**

The supply curve shows the same information as the supply schedule. At higher prices, more apartments are offered on the market by people who are in a position to sell.

Note that the supply curve in Figure 4.1 slopes upward. This seems reasonable, consistent with an expectation that suppliers of a good or service will tend to offer more for sale, the higher the price they receive. Price and quantity have a positive (or direct) relationship along the supply curve.

We see movement along a supply curve when we note, for example, that the quantity of apartments that will be offered for sale rises from 6 to 7 as the price rises from $96,000 to $97,000. This is a case of **change in quantity supplied**. It is important to refer to movement along a supply curve as change in the quantity supplied in order to avoid confusion with the topic of the next section.

**change in quantity supplied**: movement along a supply curve in response to a price change

Check yourself by answering this question with reference to Table 4.1 or Figure 4.1: By how much does the quantity supplied change when the price changes from $97,000 to $100,000?2

---

2 Answer: The quantity supplied rises by 3 apartments, from 7 apartments up to 10.
2.2 Changes in Supply

In contrast to *changes in quantity supplied*, we say there has been a **change in supply** when the whole supply curve shifts.

**change in supply**: a shift of the supply curve in response to some determinant other than the item’s price

Why might the whole curve shift? As we noted in Chapter 2, models make frequent use of ceteris paribus (“all else constant”) assumptions. The supply curve shown in Figure 4.1 holds, we presume, for a given set of circumstances. But what if circumstances were different? What if there were more sellers at each price? Or what if the same sellers were generally willing to accept lower offers?

Suppose that at each price there were two more potential sellers. The supply curve would shift to the right from \( S_1 \) to \( S_2 \) as illustrated in Figure 4.2. Now, at a price of $96,000, for example, 8 owners are willing to sell, instead of only 6. We can describe this increase in supply by saying either that “supply has risen” or that “the supply curve has shifted out.” (It may seem confusing that a supply *increase* shifts the supply curve *down*. Remember to start the “story” by reading across horizontally from the price axis. Then you will notice that the shift goes out toward higher numbers on the quantity axis.)

![Figure 4.2 An Increase in Supply](image)

*The supply curve shifts outward (to the right) when sellers decide to supply a larger quantity to the market at a given price, or to charge less for a given quantity.*

We would see the same result if, instead of new sellers entering the market, the existing sellers each became willing to accept $2,000 less. (This might happen, for instance, because increasing flood danger or crime in the area makes them more eager to sell.) In this case as well, 8 owners would now be willing to sell at a price of $96,000,
whereas before it took a price of $98,000 to get 8 owners to want to sell. This would also be termed an “increase in supply” and again the supply curve would shift as illustrated in Figure 4.2.

If instead, the number of sellers goes down, or the minimum price each seller is willing to accept rises, the supply curve will lie to the left of the original one, as shown in Figure 4.3. We say that “supply has decreased,” or “supply has fallen,” or “the supply curve has shifted back.”

Thus the number of sellers and their preferences are among the things that can affect the location of the supply curve. Many other factors affect the location of the supply curve. What exactly these non-price determinants of supply are will generally depend on what, specifically, is being sold in a market. While we've rather arbitrarily chosen a simple real estate market for our example, the determinants of supply will vary depending on whether the item in question is an asset, produced good, or service, and on particular characteristics of the item. For example, in the market for oil, the determinants of supply will include the success of oil exploration and discovery (a big new discovery will increase supply), while in the market for computers technological innovations that lower chip costs will increase supply. In the market for corn, a bad harvest would reduce supply, but new, more productive varieties of corn would increase it. You can easily think of similar examples for other goods and services.

Discussion Questions

1. Explain in words why the supply curve slopes upward.

2. Verbally explain the difference between a change in quantity supplied and a change in supply. Considering the supply side of the market for lawn-mowing services, what kind
of change (*increase* or *decrease*, in *quantity supplied* or *supply*) would each of the following events cause?

a) A rise in the going price for lawn-mowing services.
b) More people decide to offer to mow lawns.
c) Gasoline for lawn movers gets much more expensive. (Assume the person doing the mowing buys the gas.)

### 3. The Theory of Demand

Now let us assume that there a number of potential *buyers* of apartments, and that they are also well informed and interested in purchasing an apartment, to live in or rent out, if they can get one at a good price. However, they have a different point of view. They all regard a price of $100,000 as too high: none of them will purchase an apartment at that price. However, one of them is willing to much as $99,000; that individual and another potential buyer are both willing to buy if the price drops to $98,000; and so on.

#### 3.1 The Demand Schedule and Curve

In Table 4.2, we show the demand schedule that reflects this case. A demand schedule describes, in the form of a table, the quantity of a good or service that buyers are willing to purchase at each possible price.

**Table 4.2 A Demand Schedule for Apartments**

<table>
<thead>
<tr>
<th>Price ($1000s)</th>
<th>100</th>
<th>99</th>
<th>98</th>
<th>97</th>
<th>96</th>
<th>95</th>
<th>94</th>
<th>93</th>
<th>92</th>
<th>91</th>
<th>90</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity of Apartments Demanded</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
</tbody>
</table>

From the demand schedule we can graph a demand curve, as shown in Figure 4.4. Note that the demand curve in Figure 4.4 slopes downward. It seems reasonable to expect that, generally, the higher the price of a good, the fewer people will want to buy. Price and quantity have a negative (or inverse) relationship along the demand curve.

**demand curve**: a curve indicating the quantities that buyers are ready to purchase at various prices

A movement *along* a demand curve—for example, if we note that the quantity of apartments that will be purchased falls from 4 to 3 as the price rises from $96,000 to $97,000—must always be referred to as a **change in the quantity demanded**.
At a price of $96,000… …4 apartments are desired by buyers

Demand

Figure 4.4 The Demand Curve for Apartments
The demand curve shows the same information as the demand schedule. At higher prices, fewer apartments are desired by people looking to buy.

3 Answer: The quantity demanded drops by 3 apartments, from 3 apartments down to 0.

3.2 Changes in Demand

As with supply, we distinguish between a change in quantity demanded and a change in demand. When there is a change in demand, the whole curve shifts.

Why might the whole curve shift? Suppose there is a large movement of population into the area around our hypothetical apartment building. Many more people need housing. Or suppose that a number of the potential buyers experience an increase in income or inherit money from relatives, becoming able (and willing) to pay more than they formerly could afford. Specifically, suppose that at every price there are now 4 more willing buyers for apartments in this building. Such a change is illustrated by the shift to the right from $D_1$ to $D_2$ in Figure 4.5. We say that “demand has risen” or “the demand
The demand curve shifts outward (to the right) when more buyers want to buy at a given price, or buyers are willing to pay a higher price for a given quantity. We would see the same result if, instead of new buyers entering the market, the existing buyers each became willing to pay $4,000 more for an apartment. This could be because prices for similar apartments in other buildings in this city have risen. Other, similar apartments are what economists call substitutes. That is, they are items that can be used in place of other items.

A classic example of substitute goods is Coke versus Pepsi. An increase in the price of a substitute good tends to increase the demand for the good in question (because people who are unwilling to pay the higher price will shift to the substitute good whose price has not risen). A rise in the price of comparable apartments could lead to an “increase in demand” for apartments in this building. This would also be illustrated by Figure 4.5.

| substitute good: a good that can be used in place of another |

On the other hand, other things might be complements to these apartments. Complements are goods that are used along with the good in question. A classic example of complementary goods is hot dogs and mustard. Suppose, for example, the apartments are far from the locations in which people work. A rise in the price of gasoline would make these apartments less attractive. Demand for the good in question tends to decrease with an increase in the price of a complementary good. This is shown in Figure 4.6.

| complementary good: a good that is used along with another good |
Thus the number of potential buyers, their ability to pay, and things like prices of substitutes and complements are among the things that can affect the location of the demand curve. Many other factors affect the location of the demand curves, depending on the specific market in question. For example, in the market for steel, overall economic growth will increase the demand for steel, while the development of substitute materials, such as plastic composites for use in automobiles, will decrease it. Hotter weather will increase demand for ice cream, but will decrease the demand for sweaters – and so forth. We can easily identify many examples of other demand shifts in everyday life.

Discussion Questions

1. Explain verbally why the demand curve slopes downward.

2. Verbally explain the difference between a change in quantity demanded and a change in demand. Considering the demand side of the market for lawn-mowing services, what kind of change (increase or decrease, in quantity demanded or demand) would each of the following events cause?
   a) A new office park is built, surrounded by several acres of lawn.
   b) A drought is declared, and lawn watering is banned.
   c) The going price for lawn-mowing services rises.
   d) A more natural, wild yard becomes the “in” thing, as people become concerned about the effects of fertilizers and pesticides on the environment.

4. The Theory of Market Adjustment

Now that we have considered the sellers and the buyers separately, it is time to bring them together. In our thought experiment world, we assume that the buyers and
sellers all meet at once and use a double-auction spot market to make the sales. Of course, in actual real estate markets, condo apartments are usually sold one at a time, for varying prices—with the sellers, buyers, and their agents spending considerable time haggling over the terms of the sale. But in our convenient, fictional world, every apartment that changes hands will sell at the same price. (Remember, they are identical—why would anyone pay more, or accept less, than the going price?) In this world we are now ready to ask: How many apartments will change hands?

4.1 Surplus, Shortage, and Equilibrium

Using the original supply and demand curves, reproduced here in Figure 4.7, we can look for the answer by considering possible prices. Suppose we start with a high price of $99,000. At this price, nine owners will be willing to sell, but only one person will be willing to buy. Economists call a situation in which the quantity supplied is greater than the quantity demanded a surplus. This is illustrated in the upper part of Figure 4.7.

**surplus**: a situation in which the quantity that sellers wish to sell at the stated price is greater than the quantity that buyers will buy at that price

Since suppliers who are willing to sell at this price cannot find buyers, what will they do? For a number of sellers, $99,000 is more than they need to persuade them to sell. To find buyers, they will suggest a lower selling price. At $98,000 a surplus still occurs – there are eight willing sellers and only two willing buyers, so there will be further downward pressure on the price. When the price reaches $95,000, all the owners who want to sell at this price will find potential buyers who want to buy at this price. The number of apartments supplied—and demanded—is equal to 5. The equilibrium price for these apartments is $95,000. Economists call this a situation in which the “market clears” and an equilibrium is reached. “Equilibrium” describes a situation that has reached a resting point, where there are no forces to acting to change it. (Economists borrowed this term from natural science.) In a market situation, equilibrium is reached when the quantity supplied is equal to the quantity demanded. The price will stop falling. Figure 4.7 illustrates the **market-clearing equilibrium** point, labeled E.

**equilibrium**: a situation of rest, in which there are no forces that create change

**market-clearing equilibrium**: a situation in which the quantity supplied is equal to the quantity demanded
Figure 4.7 Surplus, Shortage, and Equilibrium

At a price of $99,000 a surplus occurs because the quantity of apartments being offered for sale is larger than the quantity that people want to buy. On the other hand, at a price of $91,000 many people want to buy apartments but few want to sell, so a shortage occurs. Only at equilibrium (point E) does quantity supplied equal quantity demanded.

What if the price had started out too low, for example at $91,000? In this case a shortage occurs, where the quantity supplied is less than the quantity demanded, as illustrated in the lower part of Figure 4.7. Since there are nine willing buyers and only one willing seller at that price, the buyers who are willing to pay more to get an apartment will bid the price up. As the price rises, some prospective buyers drop out of the action, while more prospective sellers enter. At $95,000, just five buyers remain, matched by five sellers.

shortage: a situation in which the quantity that buyers wish to buy at the stated price is greater than the quantity that sellers are willing to sell at that price

The theory of market adjustment says that market forces will tend to make price and quantity move toward the equilibrium point. Surpluses will lead to declines in price, and shortages will lead to rises in price. Surplus and shortage are both instances of market disequilibrium. Only at equilibrium is there no tendency to change. In this example, the equilibrium price is $95,000, and the equilibrium quantity is five.

theory of market adjustment: the theory that market forces will tend to make shortages and surpluses disappear

market disequilibrium: a situation of either shortage or surplus
4.2 Shifts in Supply and Demand

With the two curves now combined, we can investigate how market forces will cause prices and quantities to change in response to changes in the underlying nonprice determinants of supply and demand.

In our condo market, let us compare the original case shown in Figure 4.7 to a case in which the supply curve is higher. How would the auction’s result now differ, compared to the original case? In Figure 4.8, the original equilibrium is marked as E₁ with supply curve S₁. When the supply curve shifts to S₂, we see that a surplus results at the original equilibrium price of $95,000. At point E₂, with a price of $94,000 the market clears, with six apartments being traded. As Figure 4.8 illustrates, an increase in supply will tend to decrease price and increase quantity.\(^4\)

![Figure 4.8 Market Adjustment to an Increase in Supply](image)

*Figure 4.8 Market Adjustment to an Increase in Supply*

*With an increase in the supply of apartments, there now would be a surplus at the original equilibrium price of $95,000. Market adjustment forces should cause the price to fall, until a new equilibrium is established at a price of $94,000. Six apartments will sell at this new equilibrium price. The equilibrium price has fallen and the equilibrium quantity has risen.*

Suppose that instead of an increase in supply, we have an increase in demand, in this market. In Figure 4.9, we see the effect of that demand increase: at the original equilibrium price of $95,000, a shortage results. The price will be bid up to $97,000,

\(^4\) Conventionally, economists talk about this model as if the economy is *first* at E₁ and then *moves* to E₂. For example, you could think of apartments being auctioned off just once per month, so that the shift shown in Figure 4.8 comes from an increase in potential sellers between one month and the next (ceteris paribus). The formal model, however, does not actually represent any passage of time.
where 7 transactions will be made. As Figure 4.9 illustrates, an increase in demand will tend to increase price and increase quantity.

Figure 4.9 Market Adjustment to an Increase in Demand

With an increase in demand, there would be a shortage of apartments at the original equilibrium price of $95,000. Market forces should cause the price to rise, until a new equilibrium is established at $97,000. Seven apartments will sell at this new equilibrium price. The equilibrium price has risen and the equilibrium quantity has risen.

Notice that both supply and demand increases tend to increase the quantity transacted. Their price effects, however, go in opposite directions. Increases in supply make the good more plentiful, driving its price down. Increases in demand drive up the price.

Likewise, decreases in supply and demand both tend to decrease the quantity transacted. A decrease in supply will tend to raise the price, as the good is harder to get. A decrease in demand will tend to decrease the price, as fewer attempts to obtain the good are made. These effects are summarized in Table 4.3.

Table 4.3 Summary of Effects of Supply and Demand Shifts

<table>
<thead>
<tr>
<th></th>
<th>Effect on Equilibrium Price</th>
<th>Effect on Equilibrium Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase in Supply</td>
<td>fall</td>
<td>rise</td>
</tr>
<tr>
<td>Decrease in Supply</td>
<td>rise</td>
<td>fall</td>
</tr>
<tr>
<td>Increase in Demand</td>
<td>rise</td>
<td>rise</td>
</tr>
<tr>
<td>Decrease in Demand</td>
<td>fall</td>
<td>fall</td>
</tr>
</tbody>
</table>
4.3 Elasticities

By *how much* will the equilibrium quantity change, when there is a shift in the market? Economists are often interested in the answer to this question. The **price elasticity of demand** measures the degree to which buyers of a good respond to a change in its price. Mathematically, it is defined as the percentage change in quantity demanded divided by the percentage change in price. The larger the quantity response is relative to the size of the price change, the “more elastic” demand is said to be. If the response is small, demand is said to be relatively “price inelastic.”

| **Price elasticity of demand:** | the percentage change in quantity demanded divided by the percentage change in price |

Figure 4.10 graphs two different demand curves, along with identical supply curve shifts. In Figure 4.10(a), with the relatively flat demand curve, we see that there is a large drop in the quantity demanded associated with a small increase in price. In Figure 4.10(b), on the other hand, with a relatively steep demand curve, only a small decrease in quantity demanded is associated with a substantial increase in price. The demand curve shown in (a) is hence *more price elastic* than the demand curve in (b).

**Figure 4.10 Price Elasticity of Demand**

*The demand curve for a price-elastic good is relatively flat, while the demand curve for a price-inelastic good is relatively steep.*

Goods for which there are many substitutes, which are merely wanted rather than needed, or which make up a large part of the budget of the buyer tend to have relatively elastic demands. On the other hand, goods for which there are few substitutes, that are badly needed (such as essential medicines), or which make up a small part of the buyer’s budget tend to have relatively inelastic demands.

The **price elasticity of supply** measures the same sort of responsiveness, but this time on the part of sellers. Mathematically, it is defined as the percentage change in quantity supplied divided by the percentage change in price. When suppliers respond to a
small increase in price by offering a much larger quantity of goods, we say that supply is relatively elastic. If they hardly react at all, supply is relatively inelastic.

**Price elasticity of supply**: the percentage change in quantity supplied divided by the percentage change in price

**Discussion Questions**

1. Think about the market for high-quality basketballs. In each of the following cases, determine which curve shifts, and in which direction. Also draw a graph and describe, in words, the changes in price and quantity. (Treat each case separately.)
   
   (a) a rise in basketball players’ incomes
   (b) an increase in wages paid to the workers who make the balls
   (c) a decrease in the price of basketball hoops and other basketball gear
   (d) the nation becoming obsessed with soccer

2. Have you ever found yourself shut out of a class you wanted to take, because it was already full? Or has this happened to a friend of yours? Analyze this situation in terms of surplus or shortage. Are classes supplied “in a market”? Do you think it would be good if they were?

**5. Macroeconomics and the Dynamics of Real World Markets**

While supply-and-demand analysis can be a very useful tool, not every market is a perfectly competitive spot market with smoothly-functioning double-auction mechanisms. Markets may be characterized by market power (as mentioned in Chapter 2 and with the example of Microsoft), differentiated goods, imperfect information, long-term contracts or very different approaches to price determination. An issue of particular importance to macroeconomics is the question of the speed at which real-world price adjustments take place.

**5.1 When Price Adjustments are Slow**

How long will it take our hypothetical condo traders to reach equilibrium? Minutes? An hour? A day? The theory of supply and demand doesn’t tell us. The graphs represent a static model. Recall from Chapter 2 that this means that the model does not take into account the passage of time.

Some markets, like stock markets in which traders are constantly yelling bids to each other, clear quickly. But what if you don't have everyone in a room, agreeing on trades minute-by-minute? For example, consider the market for shirts. When you go into a clothing store, you see a rack of shirts and, on their tags, a given price. The price probably reflects a mark-up by the retailer over what he or she paid to a distributor to get the shirts. The distributor in turn probably charged a mark-up over the price charged by the manufacturer. Now, if the shirts are overpriced, they won’t sell very well. In the terms we introduced, there will be a surplus. If the market worked like the perfect double-
auction just described, the supplier and demander would be able to quickly fine tune the price and quantity to get it just right, similar to what we saw for our hypothetical apartment market in Figure 4.7. The price would fall, the surplus of shirts would disappear immediately, and equilibrium would be restored.

In a realistic, complicated case such as this one, however, there is actually a chain of markets involved—the manufacturer sells to the distributor, the distributor to the retailer, and the retailer to the final buyer. A quick adjustment of prices is unlikely. More commonly, while retailers may mark down the prices on the shirts they have in stock in order to clear them out, this drop in the price won’t immediately travel back up the supply chain. In the next order the retailers place with their distributors, the retailers may just ask for a smaller quantity of shirts, at the price at which the distributor is offering them—especially if the retailer is small relative to the distributor and has little power to bargain over prices. Any changes in prices or quantities at the manufacturing level will only develop over time, as the manufacturers see the level of their inventories either rise (because the shirts are not selling) or fall (because the distributors order more).

Because of the time it takes for all these things to happen, some economists believe that the most likely first response to a surplus situation is that manufacturers will cut production—perhaps laying off workers—rather than reducing their price. In this case, the quantity produced adjusts to meet the quantity demanded at a given price, rather than the price adjusting to clear the market. If such quantity adjustments happen economy-wide, unemployment could rise.

**quantity adjustments**: a response by suppliers in which they react to unexpectedly low sales of their good primarily by reducing production levels rather than by reducing the price, and to unexpectedly high sales by increasing production rather than raising the price.

Suppliers may also be reluctant to change rapidly the prices they offer due to menu costs—literally, the costs of changing the prices listed on such things as order forms and restaurant menus. In real-world markets, we generally expect market forces arising from surpluses and shortages to exert pressure on quantities and/or prices in the direction of equilibrium. This is why it is important to be familiar with the model of supply and demand. But we can’t be sure that these pressures will be strongly felt, or that an equilibrium will actually be reached. The pure market forces we have examined in our hypothetical perfectly competitive, spot, double-auction market are not the only forces in the world, nor do these forces always work smoothly and quickly. In later chapters of this book we will discuss the possible macroeconomic consequences of factors such as union contracts, lengthy production processes, and information problems. These and other factors can slow down adjustment to equilibrium—or mean that a market equilibrium doesn’t even exist.

**menu costs**: the costs to a supplier of changing prices listed on order forms, brochures, menus and the like
5.2 When Prices Swing Too Much

Other markets have adjustment processes in which prices may change rapidly. In highly organized stock markets and certain other auction-like markets, thousands of trades may take place every minute, as buyers and sellers find each other and quickly negotiate a price. Such a market can probably be thought of as in an equilibrium, or moving quickly toward one, nearly all the time.

Very rapid adjustments of prices, however, create their own set of problems. In our hypothetical market for apartments, we assumed that people wanted an apartment because they wanted to live in it, or perhaps because they saw it as long-term investment (desiring the income they might get from owning an apartment and renting it out). But sometimes in markets where prices are expected to move, buyers are not really interested in the item itself at all—only its price, and the direction in which it likely to go. Speculation is the buying and selling of assets with the expectation of profiting from appreciation or depreciation in their values, usually over a relatively short period of time. Speculators buy items such as stocks in companies, commodities futures (e.g. contracts to buy or sell items such as pork bellies or copper at a specific price on a future date), foreign exchange, and real estate purely in the hopes that they will be able to sell them in the future for more than they have paid.

**speculation:** buying and selling assets with the expectation of profiting from appreciation or depreciation in asset values.

When many people come to believe that the price of something will rise, a speculative bubble can occur, in which people buy the asset because so many other people also believe that that asset’s price will to continue rise. In a mass phenomenon often referred to by terms like “herd mentality” or “bandwagon effect,” the price of the asset becomes inflated. People’s mutually reinforcing optimism causes asset values to rise far above any price that could be rationalized in terms "economic fundamentals." In the case of a stock price, for example, the rational economic base for valuation should be the future profitability of a firm, while in the case of real estate, the value should be rationally determined by the stream of likely future rents. During a bubble, however, people pay less attention to (or take a biased view of) such fundamental factors. Instead, demand for the asset is largely determined by purchasers' perception that they will be able to find someone to sell the asset to in the future, at a high price. Eventually, however, people begin to figure out that prices have become unrealistically high, demand drops, the bubble bursts, and prices fall.

**speculative bubble:** the situation that occurs when mutually reinforcing investor optimism raises the value of an asset far above what could be realistically justified

Recent U.S. experience with a speculative bubble in stock prices is illustrated in Figure 4.11. The Nasdaq Composite stock index measures the prices of a group of stocks traded in the United States. Investors’ enthusiasm about new technologies, particularly the use of the Internet for business purposes, drove technology stocks to a high peak in
the late 1990s in what has been called the “dot-com” bubble. In the early months of 2000, a more realistic view started to catch on, and prices soon plummeted. It may be easy, of course, to recognize a bubble after the fact. During the spectacular rise in stock prices, however, many otherwise rational and intelligent people convinced each other—and themselves—that the stock market boom reflected an immense jump in productivity, not a speculative bubble.

Figure 4.11 The Stock Market Bubble of 1999-2000

Enthusiasm about new technologies, and Internet e-commerce in particular, temporarily drove the prices of many company’s stocks very high. During the bubble, the prices of stocks as determined by supply and demand rose far above the prices that would occur if valuation had been based on the companies’ actual performances.

Source: Yahoo! Finance, Monthly data.

Situations of speculative bubbles and volatile (that is, rapidly changing) prices have important implications for macroeconomics. It is not merely a coincidence that some months after the “dot-com” bubble burst, the United States economy slipped into a recession. An even more famous and dramatic case occurred in 1929, when a sudden and dramatic stock market crash precipitated the onset of the Great Depression in the United States. The bursting of a bubble in real estate and stocks in 1989 similarly led to a period of macroeconomic contraction in Japan. Wild swings in foreign exchange markets, such as swept through Indonesia, South Korea, Thailand, Hong Kong, and other countries during the Asian financial crisis of 1997-98, caused great economic dislocation and increases in poverty.

Economists debate the importance of market volatility in creating macroeconomic insecurity. Economists who take a Classical point of view tend to downplay such market-related problems, believing that, even if market performance seems sometimes counter to human welfare, it is still better than what could be achieved by any sort of
regulation or intervention. Other economists, particular some with Keynesian views or those who are particularly concerned with the economics of less industrialized nations, believe that some sort of regulation may be desirable. Some have suggested, for example, that a small tax be levied on currency trades. Proponents of such a tax—called a “Tobin Tax” after economist James Tobin, who first suggested it—argue that this would discourage speculative trades, while still allowing for productive trading. The revenues, they suggest, could be put into an international fund to combat poverty and disease. Several governments, including the government of Canada, have passed legislation agreeing to implement a Tobin Tax if enough other countries agree to participate.

5.3 From Microeconomics to Macroeconomics?

How far does the model of supply and demand get us in explaining macroeconomic phenomena? That question can be broken down into two parts. First, are real-world markets similar to the one portrayed in the model? Second, even to the extent that some markets do behave as the model predicts, might explaining national-level economic phenomena require different theoretical tools?

Later chapters of this book will examine more specifically how Classical market equilibrium models of markets for labor, finance, and produced goods compare and contrast with more Keynesian explanations of unemployment, savings and investment, and aggregate demand.

Discussion Questions

1. Think of several things you regularly buy. For which of these goods or service do prices seem to change rapidly? For which do they seem to change slowly? Can you explain why?

2. Has there been any talk of “speculative bubbles” in new reports recently? If so, what markets are being discussed? What explanations are given for why prices may be so high?

Review Questions

1. Describe three characteristics of the type of market featured in Classical analysis.
2. Define and sketch a supply curve.
3. Illustrate on a clearly-labeled graph: (a) a decrease in quantity supplied and (b) a decrease in supply.
4. Describe two factors that might cause a supply curve to shift.
5. Define and sketch a demand curve.
6. Illustrate on a clearly-labeled graph: (a) a decrease in quantity demanded and (b) a decrease in demand.
7. Describe two factors that might cause a demand curve to shift.
8. Describe how goods can be “substitutes.” Describe how the demand curve for a good may be affected by an increase in the price of a second good that is a substitute for the first.

9. Describe how goods can be “complements.” Describe how the demand curve for a good may be affected by an increase in the price of a second good that is a complement to the first.

10. Draw a graph illustrating surplus, shortage, and equilibrium.

11. Describe, using graphs, how an increase in supply affects equilibrium quantity and price. Repeat for a decrease in supply.

12. Describe, using graphs, how an increase in demand affects equilibrium quantity and price. Repeat for a decrease in demand.

13. Describe what is meant by the price elasticity of demand and the price elasticity of supply.

14. Describe how and why sellers of a good might adjust the quantity of what they produce, rather than the price.

15. What are some of the problems that can be created by wild price swings?

**Exercises**

1. Sketch a supply curve graph illustrating a student’s willingness to sell his textbooks from all his classes, right now. Assume the student will receive offers of this sort: “I’ll give you [a fixed number of dollars] apiece for all the books you want to sell.” Carefully label the vertical and horizontal axes. Suppose that at an original offer of $30 per book, the student will be willing to sell three books, since he knows he can replace these three for less than $30 each at a local bookstore. Mark this point on your first graph. Assume further that at $40 he would be willing to sell four books, at $50 he would supply five books, etc. Now, on separate graphs labeled (a), (b), and (c), show this line and his offer at $30 and the precise new point or an approximate new curve that illustrates each of the following contrasts. Consider them separately, returning to the case of no Internet resources in considering (c).
   (a) He is offered $70 per book instead of $30.
   (b) He discovers that the textbook materials for many of his classes are available free on the Internet.
   (c) The local bookstore raises its prices substantially.

2. State whether the following statements are true or false. If false, write a corrected statement.
   a. A fall in the price of a good will cause its supply curve to shift to the left.
   b. Increased costs of supplying a good will cause the supply curve to shift to the left.
   c. A fall in the price of a substitute good will cause the demand for the good in question to fall.
   d. An decrease in supply will have a small effect on the quantity demanded if the demand curve is very elastic.
3. Consider the market for diamond rings. For each of the following, draw a graph and describe the likely effects on equilibrium price and quantity (assuming the market functions like the one described in the text.) Explain your reasoning.
   a. Valentines’ Day is approaching.
   b. Manufacturers discover new industrial uses for diamonds, driving up the prices that jewelers have to pay to obtain the gems.
   c. New deposits of diamonds are discovered.
   d. The price of cubic zirconium “gems” (high quality fake diamonds) falls.
   e. People experience an increase in their wealth.

4. Match each concept in Column A with a definition or example in Column B.

<table>
<thead>
<tr>
<th>Column A</th>
<th>Column B</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. substitute goods</td>
<td>i. the stock market</td>
</tr>
<tr>
<td>b. shifts the supply curve</td>
<td>ii. a tiny drop in the price of a good leads to a big increase in quantity demanded</td>
</tr>
<tr>
<td>c. a &quot;bubble&quot;</td>
<td>iii. shoes and shoelaces</td>
</tr>
<tr>
<td>d. complementary goods</td>
<td>iv. a shoe manufacturer responds to a decline in shoe sales by cutting back on production and laying off workers</td>
</tr>
<tr>
<td>e. speculation</td>
<td>v. tea and coffee</td>
</tr>
<tr>
<td>f. market equilibrium</td>
<td>vi. quantity supplied is greater than quantity demanded</td>
</tr>
<tr>
<td>g. auction market</td>
<td>vii. buying an asset largely in hope of selling it later for a higher price</td>
</tr>
<tr>
<td>h. quantity adjustment</td>
<td>viii. quantity supplied is equal to quantity demanded</td>
</tr>
<tr>
<td>i. price elastic demand</td>
<td>ix. the number of sellers</td>
</tr>
<tr>
<td>j. surplus</td>
<td>x. when investors' optimism pushes the price of an asset artificially high</td>
</tr>
</tbody>
</table>

5. Suppose a newspaper report indicates that the price of wheat has fallen. Which of the following could be possible explanations? (There may be more than one.) Illustrate one case you choose on a supply and demand graph.
   a. A drought has hit wheat-growing areas.
   b. An increase in the price of rice.
   c. Due to increasing health concerns, tobacco farmers have begun growing other crops.
   d. A new science report suggests that wheat is bad for one’s health.

6. Prices of many financial assets such as stocks and foreign exchange are now readily available on the internet. Search for a chart such as Figure 7.12 for a stock index or foreign currency of your choosing, and print it out. During the time period covered by the
graph you found, does it seem like this market is fairly calm, or is it characterized by periods of volatility? (Caution: because price swings can be made to look relatively large or small simply by changing the scale of the graph, you may want to choose a fairly long time series, or compare the behavior of the asset you've chosen with a similar asset, in answering this question.) Is there any evidence of a speculative bubble?