

Handout 04 - ECON 101 (Fall 2026)

Markets and Equilibrium

1 Equilibrium Matches Buyers' and Sellers' Plans

As in Handouts 2 and 3, we use a **price-taking model**: no individual buyer or seller controls the market price. A **market equilibrium** is a price at which the quantity buyers want to buy equals the quantity sellers want to sell. Neither side's plans leave a shortage or surplus that pushes the price to change.

Always specify the market and time period. Consider a small market for sandwiches during a lunch hour. Let P be dollars per sandwich, Q_d the quantity demanded, and Q_s the quantity supplied, both in sandwiches per hour:

$$Q_d = 18 - 2P, \quad Q_s = P.$$

The equations describe buyers' and sellers' plans at different prices.

1.1 A completed trade is not the same thing as a planned purchase

Every sandwich actually bought is also a sandwich actually sold. Those two counts must agree, even when some customers cannot buy what they want. If four sandwiches are sold at \$4, four have also been bought—but buyers wanted ten. The market still has a **shortage of six sandwiches**.

Equilibrium compares *quantities demanded and supplied at the same price*.

Price	Q_d	Q_s	Gap	Pressure on price
\$4	10	4	Shortage: $10 - 4 = 6$	Upward
\$6	6	6	None	No pressure from an imbalance
\$8	2	8	Surplus: $8 - 2 = 6$	Downward

Both gaps are measured in *sandwiches per hour*. The shortage is not a \$6 price increase, and the surplus is not \$6 of profit. Here, *surplus* means excess quantity supplied, rather than the net benefit discussed in Handout 1.

1.2 Why the price tends to adjust

With a shortage, buyers compete for the limited amount offered, putting upward pressure on the market price. As that price rises, buyers want fewer sandwiches and sellers offer more. With a surplus, competition among sellers for customers puts downward pressure on the price; buyers want more and sellers offer fewer.

These responses are **movements along the existing curves**. Buyers' preferences and sellers' production conditions have not changed. In this model, prices can adjust until the quantities match, although adjustment may take time. If the price is fixed, a shortage or surplus can persist.

1.3 Reading the solution as an agreement between plans

Equating the two plans gives the equilibrium price and quantity:

$$18 - 2P = P \implies P^* = 6, \quad Q^* = 6.$$

The star labels an equilibrium value. Checking both equations gives $Q_d = 18 - 2(6) = 6$ and $Q_s = 6$: at \$6 per sandwich, buyers want six and sellers offer six. That agreement is what the intersection of the curves represents.

Where to revisit the material. Equilibrium and adjustment: textbook pp. 88–91, slides 9–11 and 16–23, worksheet Q2; **Equilibrium equations:** slides 12–15, worksheet Q5. Textbook references use Stevenson and Wolfers, *Principles of Microeconomics*, 3rd ed. Slide numbers count PDF pages.

2 One Curve Shifts; Both Sides Respond

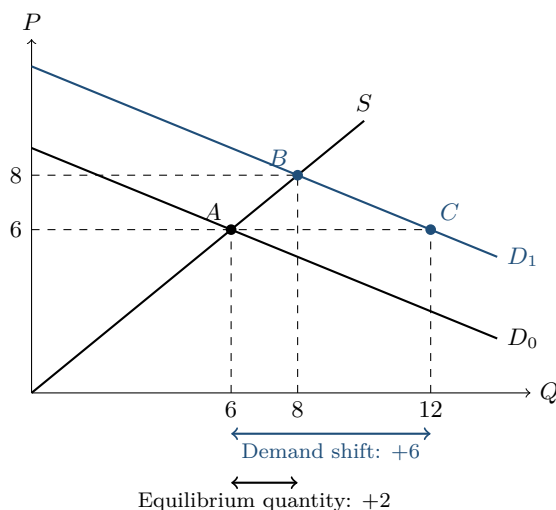
Suppose new offices open nearby, bringing more lunchtime customers. Buyers now want six more sandwiches per hour at every price. Sellers' costs and other supply conditions stay the same. **Demand shifts right; supply stays in place.** The additional customers change the buying plan, even before the price adjusts.

$$Q_d^{\text{new}} = 18 - 2P + 6 = 24 - 2P, \quad Q_s = P.$$

2.1 Start at the old price to see what causes the adjustment

At the old price of \$6, buyers now want twelve sandwiches while sellers still offer six. This creates a shortage of six. As price rises, sellers offer more along the unchanged supply curve. Buyers reduce the amount they want along the *new* demand curve. The two quantities meet at the new equilibrium:

$$24 - 2P = P \implies P^* = 8, \quad Q^* = 8.$$



D_0 : original demand; D_1 : new demand.

A: original equilibrium, $P = 6$, $Q = 6$.

C: **quantity demanded at the old price.** Buyers want twelve; sellers offer six. This is not an equilibrium.

B: new equilibrium, $P = 8$, $Q = 8$. Sellers move from A to B along S; buyers move from C to B along D_1 .

2.2 A six-unit shift does not mean six more units are traded

The demand shift compares purchases at the *same price*: at \$6, desired purchases rise from six to twelve. The equilibrium comparison allows the price to change: actual equilibrium quantity rises from six to eight.

The higher price accounts for the difference. At \$8, buyers want four fewer sandwiches than they would on the new demand curve at \$6: $24 - 2(8) = 8$, compared with $24 - 2(6) = 12$. Thus a six-unit rightward shift produces a two-unit increase in equilibrium quantity. The size of a curve's shift and the change in equilibrium quantity answer different questions.

2.3 Keep the cause separate from the market's response

More customers change demand. **The resulting higher price** changes quantity supplied along supply. Saying that supply must shift because buyers want more skips this distinction. A supply shift would need a change in supply conditions, such as cheaper ingredients or additional sellers.

The same sequence works when supply changes. If ingredients become cheaper, sellers offer more at the old sandwich price, creating a surplus. The price falls, and buyers purchase more along the unchanged demand curve. An increase in purchases does not, by itself, show an increase in demand.

Where to revisit the material. Single shifts and the new equilibrium: textbook pp. 93–95, slides 32–38, worksheet Q1 and Q4; **Writing a shift in an equation:** slide 57; **The underlying distinction between a shift and a movement:** Handout 2, p. 1, and Handout 3, p. 2; **Graphical overview:** textbook *Chapter at a Glance*, p. 104.

3 Several Changes: Separate the Effects Before Combining Them

Two events need not mean two curves shift: both might affect buyers, or both might affect sellers. Identify each event's effect before combining them.

3.1 When two events push the same curve in opposite directions

Suppose new offices bring more potential customers, but workers also develop a stronger preference for packed lunches. More customers raise sandwich demand; the changed preference lowers it. Without knowing which effect is larger, we cannot tell whether demand rises or falls overall. With supply fixed, price and quantity could both rise, both fall, or remain unchanged if the effects cancel.

3.2 When demand rises and supply falls

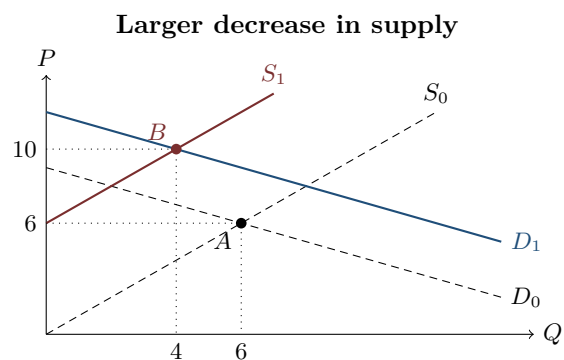
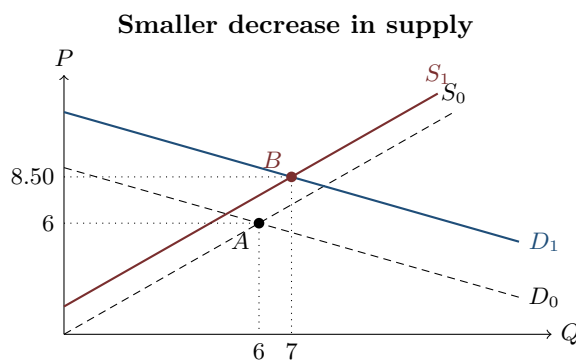
Return to the new offices, but now suppose ingredients also become more expensive. More customers shift demand right; higher production costs shift supply left. Consider each change on its own before combining them:

Change	Effect on price	Effect on quantity
Demand increases; supply held fixed	Rises	Rises
Supply decreases; demand held fixed	Rises	Falls
Both changes together	Rises	Not determined

Both changes push price up, so that prediction survives. Their effects on quantity oppose each other. Quantity may rise, fall, or stay the same, depending on the sizes of the shifts. **Not determined** means the information allows several outcomes; it does not mean that quantity must stay unchanged.

3.3 A sketch illustrates one outcome, not every possible outcome

Both diagrams start at A and use the same increase in demand, from D_0 to D_1 . Only the size of the supply decrease differs. Dashed curves show the original plans; solid curves show the new plans. Each new equilibrium is B .



Both sketches fit the description “demand increases and supply decreases,” yet quantity moves in opposite directions. Without the sizes of the shifts, neither sketch establishes what quantity *must* do. Quantity can also stay at six: with $Q_d = 24 - 2P$ and $Q_s = P - 3$, the new equilibrium is $P = 9$, $Q = 6$.

Reading backward from an observed price. A higher price alone cannot tell us whether demand increased, supply decreased, or both happened. The quantity change provides another clue. The textbook and slides explain how to use both observations together; see the references below.

Where to revisit the material. **Multiple events affecting demand:** worksheet Q3; **Both curves shifting:** textbook pp. 99–101, especially Figure 7 on p. 100 and Figure 8 on p. 101, slides 39–44 and 47–51; **Interpreting market data:** textbook pp. 102–103, slides 52–56.