

**“Prices:
The Marketplace’s Communication System”**
April 2013

Classroom Edition

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Common Core Standards (see page 13)

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Erin A. Yetter

Economic Education Group of the Federal Reserve Bank of St. Louis

PAGE ONE Economics

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NEWSLETTER

April ■ 2013

Prices: The Marketplace's Communication System

Erin A. Yetter, *Economic Education Specialist*

*"You should leave your Grox home
when you travel by air.
If you take him along,
they charge double fare."
—Dr. Seuss¹*

In the past, airlines did not charge customers to check their bags; the cost of checking baggage was already included in the price of the airline ticket. However, this is no longer the case for most of the largest U.S. airlines. Fees for checked bags range from \$20 to \$25 for the first bag, \$20 to \$40 for the second bag, and \$20 to \$125 for each bag thereafter.² What do you think happened to the number of checked bags when this change occurred? And what happened to the availability of in-cabin overhead and underseat storage space? Answering these questions requires an understanding of the pivotal role price plays in a market economy.

The Dual Role of Prices

Prices serve two main purposes in a market economy. First, they send signals. A **signal** is a way to reveal credible information to another party. Prices send signals to buyers and sellers about the relative scarcity of a good or service. In the case of the airlines, when they started to charge fees for checked bags, they were signaling buyers to check fewer bags. Second, prices provide incentives to buyers and sellers. Generally, an **incentive** is anything that motivates action; an incentive can be either positive or negative. The airlines introduced a negative incentive when they implemented checked bag fees to reduce the number of checked bags on their flights.

How Prices Are Determined

Interaction between buyers and sellers determines prices in market economies through the invisible forces of supply and demand.³ When a market is in equilibrium, the quantity that buyers are willing and able to buy (demand) is equal to the quantity that sellers are willing and able to produce (supply). The price at which supply equals demand at any moment is known as the market-clearing or **equilibrium price**. At this price, sellers have sold all they want to sell and buyers have purchased all they want to buy.

To understand how and why prices adjust to the equilibrium price, let's consider when the market price is not in equilibrium. When the market price exceeds the equilibrium price, the quantity supplied of a good will exceed the quantity demanded of a good. That is, there will be a **surplus**. In this case, sellers must decrease their prices to get rid of their excess supply. Buyers

will respond to this decrease in price by buying more of the good until the excess supply is gone and the market is back to equilibrium.

Conversely, when the price of a good is too low, a **shortage** will occur. That is, the quantity demanded of a good will be greater than the quantity supplied. In this case, more buyers will be willing and able to buy the good at the low price than there will be sellers willing and able to supply it. Sellers will view the shortage as a signal that they can raise prices; buyers will then demand less of the good or buy another, similar good instead.

A good example of buyers demanding less of a good is the reduced number of checked bags on airlines. More passengers are now choosing to carry on their baggage to avoid paying checked baggage fees. But the subsequent increase in carry-on baggage has caused a shortage of overhead and underseat storage space on flights. In response to this shortage, some airlines now charge fees for carry-on baggage as well. Buyers who check baggage will respond by packing fewer bags overall or by switching to an airline with no baggage fees. They will continue to do so until the excess demand for the overhead and underseat storage space on flights is alleviated and the market is back to equilibrium.

Government Intervention

As discussed previously, the laws of supply and demand determine prices, at least insofar as government rules permit them to do so. Governments sometimes intervene to control prices for a variety of reasons. For example, the government may control prices for political reasons or in an attempt to ensure equitable distribution of resources. The two major types of government price controls are price ceilings and price floors.

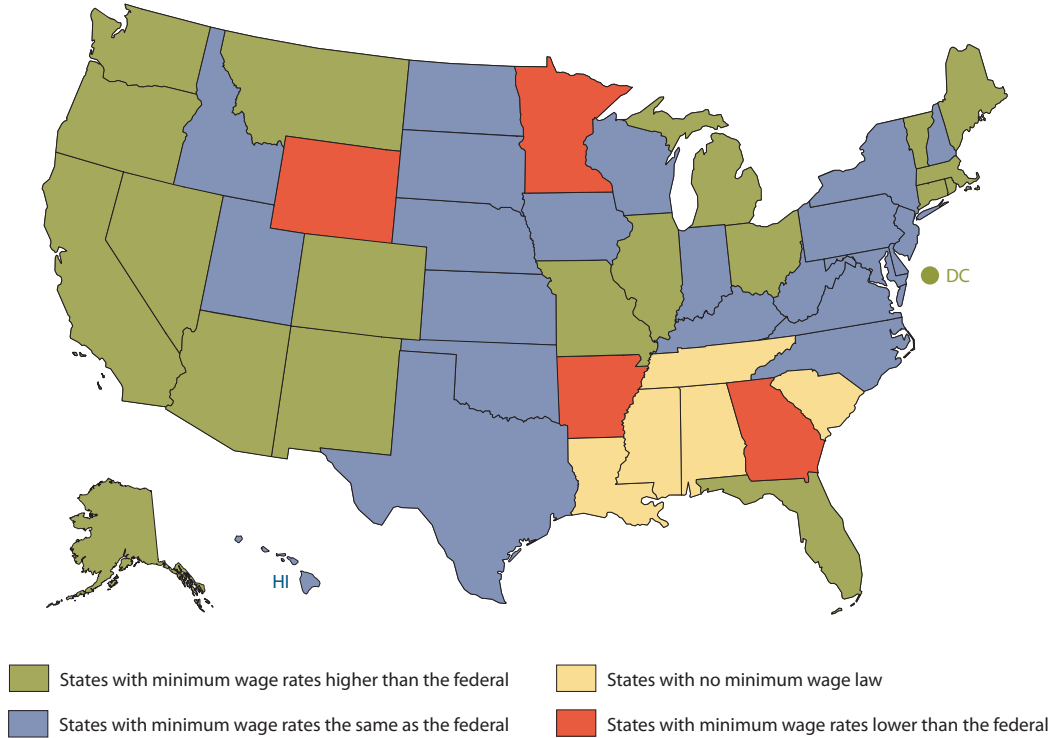
A **price ceiling** is a government-mandated maximum price that can be charged for a good or service. A price ceiling holds if the equilibrium price exceeds the price ceiling and there is a shortage of the good. Rent control is an example of a price ceiling specific to the housing market. From our previous discussion of supply and demand, we know rent control will result in a shortage of apartments, because at the lower price the quantity of housing demanded by renters will exceed the quantity supplied by landlords.

The second type of price control is a **price floor**, which is a government-mandated minimum price that must be paid for a good or service. The minimum wage is a well-known example of a price floor in the labor market. The minimum wage is the minimum price an employer can pay a worker for one hour of labor. The federal government sets a national minimum wage, but individual states can also set their state minimum wages at different levels; however, the higher rate prevails (see the chart).⁴ When the market price for labor is set above the equilibrium price for labor, as is often the case with minimum wage, a surplus will ensue. There will be more people willing to work at the minimum wage than there are employers willing to hire them.

Conclusion

Prices are determined in response to the forces of supply and demand. Governments sometimes intervene to control prices for a variety of reasons. Regardless of whether prices are too high or too low, the interaction between buyers and sellers in the market, through a series of invisible connections, pushes the market price toward the equilibrium price. In equilibrium, no desired trades go unmade. That is, all buyer and seller pairs can trade if they want to, so there is no incentive for prices to change. ■

Minimum Wage Laws in the United States (January 1, 2013)



NOTE: Where federal and state laws have different minimum wage rates, the higher rate applies. The federal minimum wage for covered nonexempt employees is currently \$7.25 per hour.

SOURCE: U.S. Department of Labor, Wage and Hour Division (<http://www.dol.gov/whd/minwage/america.htm>).

NOTES

¹ Dr. Seuss. *Oh Say Can You Say?* New York: Random House, 1979, p. 10. Special thanks to Ben Miller and Michael Watts for inspiring this discussion in their paper “Oh, the Economics You Will Find in Dr. Seuss!” *Journal of Economic Education*, 2011, 42(2), pp. 147-67.

² See the airfarewatchdog website (<http://www.airfarewatchdog.com>). Prices referenced are accurate as of February 2013.

³ For more information on the forces of supply and demand, access the St. Louis Fed’s Economic Lowdown Podcast Series for supply (http://www.stlouisfed.org/education_resources/economic-lowdown-podcast-series/supply/) and demand (http://www.stlouisfed.org/education_resources/economic-lowdown-podcast-series/demand/).

⁴ The higher wage rate prevails for businesses whose employees engage in interstate commerce, produce goods for interstate commerce, or handle, sell, or work on goods or materials that have been moved in or produced for interstate commerce only. See the Department of Labor’s “Wages and Hours Worked: Minimum Wage and Overtime Pay” (<http://www.dol.gov/compliance/guide/minwage.htm>).

GLOSSARY

Equilibrium price: The price at which quantity demanded and quantity supplied are equal.

Incentive: Anything that motivates action; an incentive can be positive or negative.

Price ceiling: A government-mandated maximum price that can be charged for a good or service.

Price floor: A government-mandated minimum price that must be paid for a good or service.

Shortage: When the quantity demanded of a good or service exceeds the quantity supplied.

Signal: A way to reveal credible information to another party.

Surplus: When the quantity supplied of a good or service exceeds the quantity demanded.

Page One Economics Newsletter from the Federal Reserve Bank of St. Louis provides an informative, accessible economic essay written by our economic education specialists, who also write the accompanying classroom edition and lesson plan. The newsletter and lesson plans are published 9 times per year, January through May and August through November.

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Federal Reserve Bank of St. Louis *Page One Economics Newsletter*:
“Prices: The Marketplace’s Communication System”

After reading the article, answer the following questions.

1. Complete the following table regarding the dual role of prices.

| Role of price | High price | Low price |
|-----------------------|------------|-----------|
| Signal sent to market | | |
| Type of incentive | Consumer: | Consumer: |
| | Producer: | Producer: |

2. Why does a shortage in the market suggest prices for a good or service were initially too low?

3. How do producers usually respond to a surplus?

4. What happens in a market when the government mandates prices (either through price ceilings or price floors)?

5. Suppose the government became concerned about the baggage fees airlines were charging for the first checked bag and imposed a price ceiling of \$15. Given the demand and supply schedule below, what would be the result of such a regulation? Remember, the quantity supplied in this situation is the space the airline makes available on the plane for checked baggage at a particular price. What is being demanded is the space for the bag of a person who is willing to pay the listed price.

| Price | Quantity demanded | Quantity supplied |
|-------|-------------------|-------------------|
| \$10 | 275 | 150 |
| \$15 | 225 | 175 |
| \$20 | 200 | 200 |
| \$25 | 175 | 225 |
| \$30 | 150 | 275 |

Teacher's Guide

Federal Reserve Bank of St. Louis *Page One Economics Newsletter*: "Prices: The Marketplace's Communication System"

After reading the article, answer the following questions.

1. Complete the following table regarding the dual role of prices.

| Role of price | High price | Low price |
|-----------------------|--|---|
| Signal sent to market | A good or service is relatively more scarce. | A good or service is relatively less scarce. |
| Type of incentive | Consumer: Incentive to find substitutes | Consumer: Incentive to buy |
| | Producer: Incentive to produce more as firms seek higher profits | Producer: Incentive to produce less or move to the production of a higher-priced good |

2. Why does a shortage in the market suggest prices for a good or service were initially too low?

Consumers were willing and able to buy more than producers were willing and able to produce at that price, thus creating excess quantity demanded (i.e., a shortage) of the good or service.

3. How do producers usually respond to a surplus?

They lower the price of the good or service.

4. What happens in a market when the government mandates prices (either through price ceilings or price floors)?

When the government intervenes in a market, it interferes with the market's ability to allocate goods, services, and resources efficiently. Thus, the market will be in state of disequilibrium and either surpluses or shortages will exist.

5. Suppose the government became concerned about the baggage fees airlines were charging for the first checked bag and imposed a price ceiling of \$15. Given the demand and supply schedule below, what would be the result of such a regulation? Remember, the quantity supplied in this situation is the space the airline makes available on the plane for checked baggage at a particular price. What is being demanded is the space for the bag of a person who is willing to pay the listed price.

| Price | Quantity demanded | Quantity supplied |
|-------|-------------------|-------------------|
| \$10 | 275 | 150 |
| \$15 | 225 | 175 |
| \$20 | 200 | 200 |
| \$25 | 175 | 225 |
| \$30 | 150 | 275 |

Passengers would want to check 225 bags (quantity demanded), but the airlines would be willing to accept only 175 bags (quantity supplied), resulting in a shortage of checked baggage space for 50 bags.

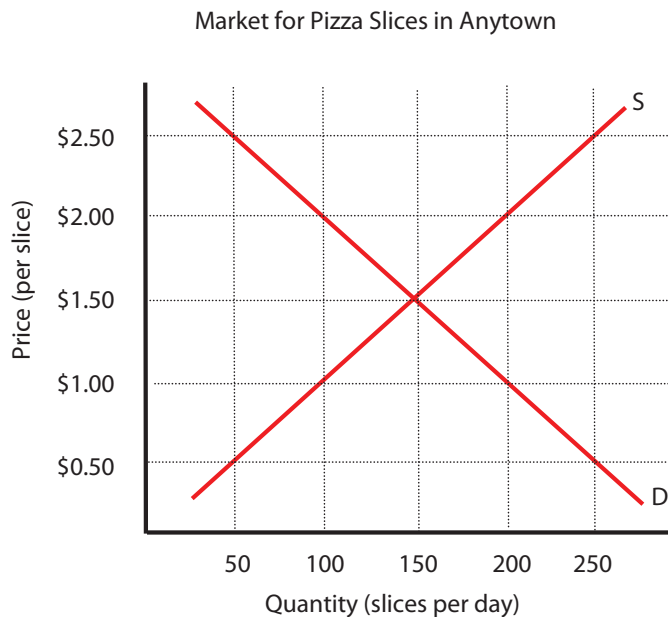
Your students may note that the space the airline makes available for baggage is relatively fixed, so why would they refuse to check additional baggage? In reality, they may not. However, less baggage means the plane weighs less and would therefore use less fuel for the flight and save the airline money. Alternatively, the airline could use the additional space to transport cargo, which would make the airline money.

For Further Discussion

Review the following or distribute as a handout to your students; then use the graphs to lead a classroom discussion on the supply and demand for pizza slices in Anytown under various conditions.

Equilibrium

Consider the market for pizza slices in Anytown illustrated below:

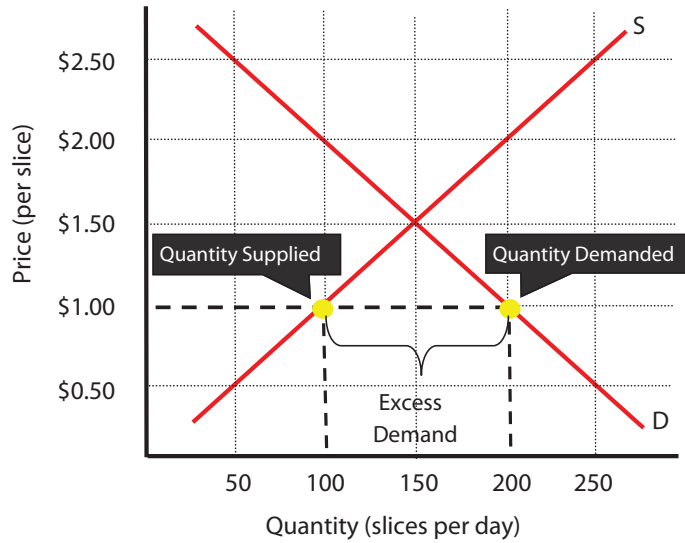


In this market, there is a supply of pizza slices (S) and a demand for pizza slices (D). We know that when a market is in equilibrium, the quantity that buyers are willing and able to buy (demand) is equal to the quantity that sellers are willing and able to produce (supply). At the equilibrium price of \$1.50 per slice, producers of pizza are willing and able to supply 150 slices per day and pizza consumers are willing and able to buy 150 slices per day. The market is in a state of equilibrium because the quantity supplied equals the quantity demanded.

Shortage

Instead of charging the equilibrium price of \$1.50 per slice, what would happen if pizza producers decided to charge \$1.00 per slice in an attempt to attract more customers? All else held constant, this would cause a shortage in the market for pizza slices in Anytown. Consider the graph at the top of the next page:

Market for Pizza Slices in Anytown

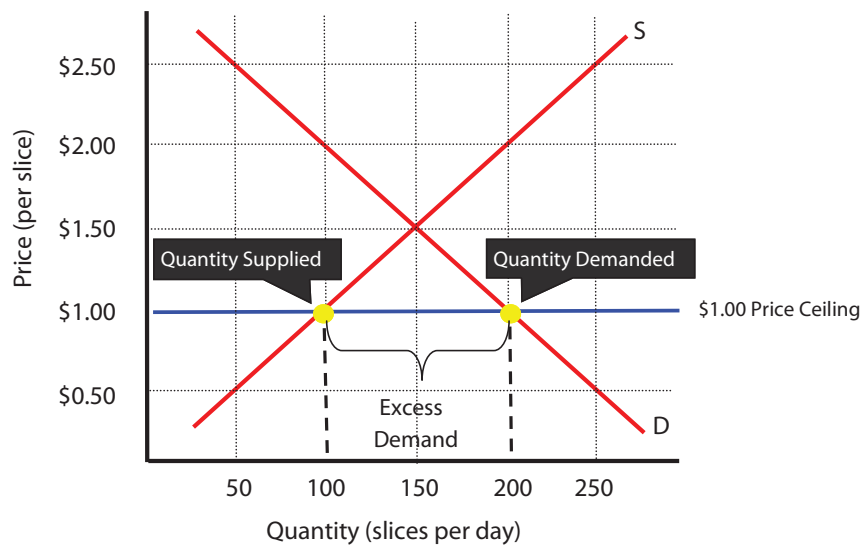


At a price of \$1.00 per slice, consumers are willing and able to buy 200 slices per day (quantity demanded), but producers are willing and able to supply only 100 slices per day (quantity supplied). At a price of \$1.00 per slice, there is an excess quantity demanded of pizza slices. In other words, there is a shortage of 100 slices.

Price Ceiling

Recall that a price ceiling is a government-mandated maximum price a producer can charge for a good or service. The same outcome as illustrated above would ensue if the government mandated a price ceiling at \$1.00 per slice. Consider the graph below:

Market for Pizza Slices in Anytown
with a Price Ceiling Imposed

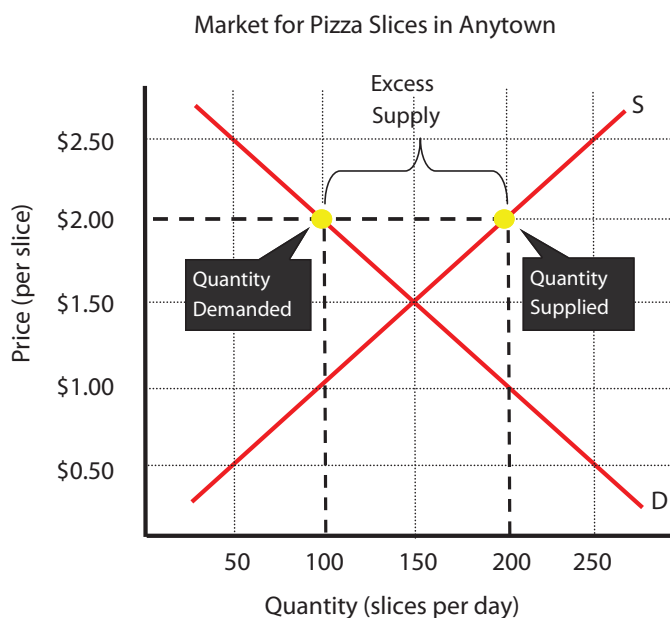


At the government-mandated price of \$1.00 per slice, consumers are willing and able to buy 200 slices per day (quantity demanded), but producers are willing and able to supply only 100 slices per day (quantity supplied). Thus, with a price ceiling at \$1.00 per slice, there is an excess quantity demanded of pizza slices. In other words, there is a shortage of 100 slices.

There is a difference between the first example—prices willingly lowered by producers—and the second example—prices limited by government intervention. In the first example, the shortage will clear if producers raise prices. In the second example, producers can't raise prices because the government won't allow it, so the shortage will persist. Real-world examples of price ceilings include rent controls in New York City and electricity price controls in California.

Surplus

Instead of charging the equilibrium price of \$1.50 per slice, what would happen if pizza producers decided to charge \$2.00 per slice in attempt to increase profits? All else held constant, this would cause a surplus in the market for pizza slices in Anytown. Consider the graph below:

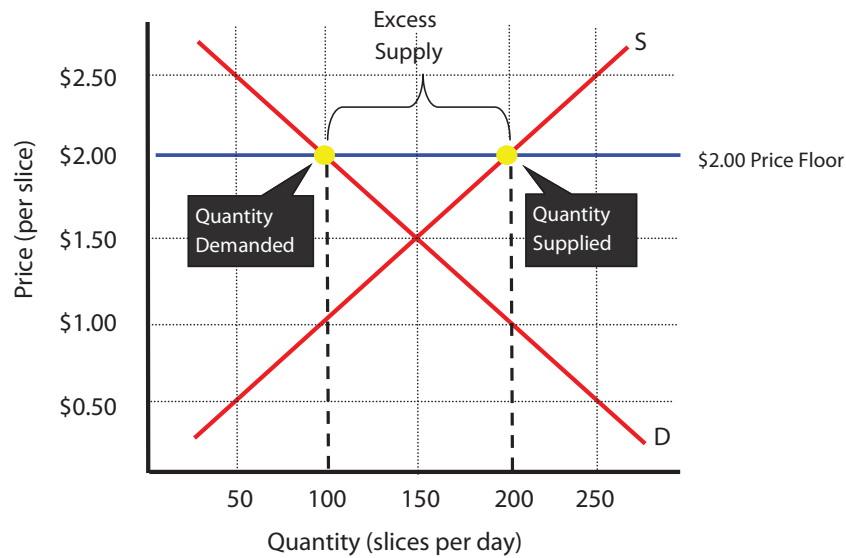


At a price of \$2.00 per slice, producers are willing and able to supply 200 slices per day (quantity supplied), but consumers are willing and able to buy only 100 slices per day (quantity demanded). Thus, at a price of \$2.00 per slice, there is an excess quantity supplied of pizza slices. In other words, there is a surplus of 100 slices.

Price Floor

Recall that a price floor is a government-mandated minimum price a producer can charge for a good or service. The same outcome as illustrated above would ensue if the government mandated a price floor at \$2.00 per slice. Consider the graph on the next page:

Market for Pizza Slices in Anytown
with a Price Floor Imposed



At the government-mandated price of \$2.00 per slice, producers are willing and able to supply 200 slices per day (quantity supplied), but consumers are willing and able to buy only 100 slices per day (quantity demanded). Thus, with a price floor at \$2.00 per slice, there is an excess quantity supplied of pizza slices. In other words, there is a surplus of 100 slices.

There is a difference between the first example—prices willingly raised by producers—and the second example—prices raised by government intervention. In the first example, the surplus will clear if producers lower prices. In the second example, producers can't lower prices because the government won't allow it, so the surplus will persist. Real-world examples of price floors include the federal minimum wage and minimum crop prices in the European Union.

Common Core State Standards

Grades 6-12 Literacy in History/Social Studies and Technical Subjects

- **Key Ideas and Details**

RH.11-12.1: Cite specific textual evidence to support analysis of primary and secondary sources, connecting insights gained from specific details to an understanding of the text as a whole.

RH.11-12.2: Determine the central ideas or information of a primary or secondary source; provide an accurate summary that makes clear the relationships among the key details and ideas.

- **Craft and Structure**

RH.11-12.4: Determine the meaning of words and phrases as they are used in a text, including analyzing how an author uses and refines the meaning of a key term over the course of a text (e.g., how Madison defines *faction* in *Federalist* No. 10).