
(The Macro Economy Today, 14 Edition SOLUTIONS MANUAL by Bradley Schiller, Karen Gebhardt)


Chapter 3: Supply and Demand Solutions Manual

Learning Objectives for Chapter 3

After reading this chapter, you should know
LO 03-01. The nature and determinants of market demand.
LO 03-02. The nature and determinants of market supply.
LO 03-03. How market prices and quantities are established.
LO 03-04. What causes market prices to change.
LO 03-05. How government price controls affect market outcomes.

Questions for Discussion

1. In our story of Tom, the student confronted with a web design assignment, we emphasized the great urgency of his desire for web tutoring. Many people would say that Tom had an "absolute need" for web help and therefore was ready to "pay anything" to get it. If this were true, what shape would his demand curve have? Why isn't this realistic? (LO 03-01)

   **Answer:** If Tom did have an "absolute demand" for web design as suggested here, his demand curve for web design would be a vertical line. With a vertical demand curve, he would be willing to pay any price for web design help. This is an unrealistic situation because Tom would not pay just any price for web design help. His income is limited, thus limiting the price he is able to pay. In addition, the value of the web design services and passing the course is limited. Tom also desires other goods and wouldn't be willing to spend all of his income on web design help.

2. How did Samsung’s unveiling of the Galaxy S5 affect the demand for the S4 (News, p. 51)? What determinant(s) of demand changed? How did Walmart’s price cut compensate? (LO 03-01)
**Answer:** The new Samsung Galaxy S5 is a substitute for the older S4 version. When new products become available, the demand for the older product decreases. Because of the decrease in demand for the S4, Walmart must decrease the price in order to sell out of the older phone.

3. With respect to the demand for college enrollment, which of the following would cause (1) a movement along the demand curve or (2) a shift of the demand curve? (LO 03-04)
   a. An increase in incomes.
   b. Lower tuition.
   c. More student loans.
   d. An increase in textbook prices.

**Answer:**
   a. College enrollment is considered to be a normal good—more specifically, a good for which as income increases demand for it increases. As incomes increase, more people are able to purchase a college education, and the demand for college education increases, shifting the demand curve to the right.
   b. Tuition is the price of a college education. As tuition decreases, the price of a college education decreases, causing an increase in the quantity demanded of college education. Thus lower tuition causes a movement down and along the demand curve for college education.
   c. When more student loans become available, more people can afford to purchase a college education, and the demand curve for college education increases. Therefore, an increase in the number of student loans causes the demand curve for college enrollment to shift to the right.
   d. Textbooks are considered to be a complement in consumption for a college education. In other words, these are items that are often consumed together. As the price of textbooks increase, the quantity of textbooks demanded decreases. As students purchase fewer textbooks, the demand for college education decreases, shifting the demand curve for college enrollment to the left.

4. What would have happened to shrimp prices and consumption if the government had prohibited price increases after the BP oil spill (see News, p. 58)? (LO 03-05)

**Answer:** If the government had prohibited price increases, this would have been considered a price ceiling. As discussed in this chapter, price ceilings result in a shortage: consumers are willing to purchase a greater quantity (quantity demanded) than suppliers are willing (or able) to supply (quantity supplied). The resulting shortage might have led to long waiting lines for shrimp.

5. Why are scalpers able to resell tickets to the NCAA finals at such high prices (News, p. 61)? (LO 03-02)
**Answer:** The demand is downward-sloping, and the supply is likely vertical at the quantity of seats available for the Final Four. Scalping can occur if the equilibrium price is above the price set by producers of an event for the fixed amount of tickets available. In other words, if the face value price of a ticket is well below the equilibrium price for the Final Four basketball games, people can resell their tickets for a higher price than what they originally paid. With scalping, those with the highest willingness to pay will buy a ticket. Without scalping, those who were lucky enough to get the original distribution of tickets will attend (unless an underground market for tickets develops).

6. In Figure 3.8, why is the organ demand curve downward-sloping rather than vertical? (LO 03-01)

**Answer:** In any market-driven system, the law of demand applies—there is an inverse relationship between price and quantity demanded. At higher prices, fewer people can afford to buy any good—even life-giving organs. At lower prices, more people can afford to buy.

7. The shortage in the organ market (Figure 3.8) requires a nonmarket rationing scheme. Who should get the available ($q_o$) organs? Is this fairer than the market-driven distribution? (LO 03-05)

**Answer:** To determine who should receive the available organs, many variables could be considered. Age could be one variable, giving priority to younger people who would live longer and contribute more to the economy (or society) than older people. Priority could be given to those with a higher standard of living, who presumably could take better care of the valuable organs. Access to medical facilities equipped to provide follow-up care might give urban dwellers an edge over those living in rural areas. Another consideration could be the cause of the need for the transplant, giving less priority to those living a “risky” lifestyle (such as drug addicts). There is clearly an opportunity cost associated with each of these variables. What is fair depends on your point of view. The market system definitely gives priority to wealthier individuals.

8. What would happen in the apple market if the government set a *minimum* price of $5.00 per apple? What might motivate such a policy? (LO 03-05)

**Answer:** Assuming the minimum price was set above the market price, the quantity of apples supplied would be greater than the quantity demanded, resulting in a surplus of apples. Policy makers might have reason to believe that apple farmers are not able to compete in the world market at low market prices. This could potentially motivate policy makers to protect apple farmers with a guarantee of higher prices.
9. The World View on page 63 explains why oil prices rose after the attack on Malaysia Airlines. What caused prices to rise and what will bring prices down? (LO 03-04)

**Answer:** According to the World View, oil prices rose due to a decrease in supply. More specifically, worldwide oil supply decreased due to the sanctions against Russia limiting their ability to export oil. This restriction of oil supply will cause a rise in oil prices. Forces that either decrease demand or increase supply would be necessary to bring prices down. For example, decreasing worldwide oil demand because of improvements in solar technology and/or increasing worldwide oil supply through increased oil production in the Middle East would bring prices down.

10. Is there a shortage of on-campus parking at your school? How might the shortage be resolved? (LO 03-03)

**Answer:** Most schools have an on-campus parking shortage. This shortage could be resolved in a number of ways. The government (campus administration) could intervene and restrict the number of cars allowed on campus. For example, some schools do not allow first- and second-year students to bring cars to campus. This method, of course, harms first- and second-year students who would otherwise bring cars to campus. A second method would be to sell parking privileges. If the price of parking stickers is set appropriately, the parking problem will be resolved. Only those students who perceive the benefit of parking to be greater than or equal to the cost of parking would purchase parking stickers. Those who do not believe the benefits received from parking on campus are worth the price would either not bring cars to school or park off campus.

**Problems**

1. According to Figure 3.3, at what price would Tom buy 12 hours of web tutoring?
   (a) Without a lottery win.
   (b) With a lottery win. (LO 03-01)

**Answers:**
(a) $20/hour.
(b) $35/hour.

**Feedback:**
(a) According to Figure 3.3, the “initial demand” curve ($D_1$) is Tom’s demand for web tutoring without a lottery win. Therefore, Tom would buy 12 hours of web tutoring only when the price of web tutoring is $20/hour.
(b) If Tom’s income increased due to a lottery win, his new demand curve would be represented as the “increased demand” curve ($D_2$). In this case, a rise in income causes a shift in the demand curve to the right. Examining this new “increased demand” ($D_2$), we see that Tom would be willing to pay $35/hour for 12 hours of web tutoring.
2. According to Figures 3.5 and 3.6, what would the new equilibrium price of tutoring services be if Carlos decided to stop tutoring? (LO 03-03)

**Answer:** $20/hour.

**Feedback:** According to Figure 3.6, when Carlos was in the market, the equilibrium price was $20, where quantity supplied equals quantity demanded at 39 hours per semester. If Carlos decided to drop out of the market, quantity supplied at equilibrium would remain 39 since Carlos supplied 0 hours of tutoring at the $20 market price. Thus the new equilibrium price would remain at $20.

3. According to the News on page 61
(a) What was the initial price of a ticket to the NCAA finals?
(b) At that price was there (A) an equilibrium, (B) a shortage, or (C) a surplus? (LO 03-03)

**Answers:**
(a) $47/ticket.
(b) Shortage.

**Feedback:**
(a) According to the News article “The Real March Madness: Ticket Prices,” when a price of $47/ticket was initially offered, tickets sold out nearly immediately. A short time later, various web sites were selling tickets ranging from $325 to $5,000.
(b) This scenario, in which not all consumer demands can be satisfied at the market price, is known as a market shortage. A market shortage exists because the quantity demanded greatly exceeds the quantity supplied at the price of $47.

4. Given the following data on gasoline supply and demand,
(a) What is the equilibrium price?
(b) How large of a market shortage would exist if the government set a price ceiling of $1 per gallon? (LO 03-03)

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<thead>
<tr>
<th>Price per gallon</th>
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<tr>
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<td>Eddie</td>
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**Price per gallon**

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<tbody>
<tr>
<td>Quantity supplied (gallons per day)</td>
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</tr>
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</table>
Firm A 3 3 2 2 1
Firm B 7 5 3 3 2
Firm C 6 4 3 3 1
Firm D 6 5 3 2 0
Firm E 4 2 2 2 1
Market total – – – – –

Answers:
Market answers (a) 5 10 13 15 22
Market answers (b) 26 19 13 12 5
(a) $3.00/gallon.
(b) 17-gallon shortage.

Feedback:
To determine the market demand for gasoline at a particular price, we simply need to add the quantity demanded for each of the individual market participants at that price. For example, at a price of $3.00/gallon, we add Al’s, Betsy’s, Casey’s, Daisy’s, and Eddie’s quantities demanded of gasoline (3 + 1 + 3 + 4 + 2), and we get a market demand of 13 gallons/day. At a price of $3.00/gallon, we add Firms A, B, C, D, and E (2 + 3 + 3 + 3 + 2), and we get a market supply of 13 gallons/day. We do the same thing for market supply.
(a) Remember that equilibrium price is the market price where quantity of a good demanded equals quantity supplied. Therefore, $3.00/gallon, the example provided in (a), is the equilibrium price. This is the price where the quantity of the good demanded (13 gallons/day) is equal to the quantity supplied (13 gallons/day).
(b) If the government set a price ceiling of $1/gallon, market demand (the quantity demanded for the market) would equal 22 gallons, and market supply (the quantity supplied for the market) would equal 5 gallons. Therefore, 17 more gallons (22 - 5) would be demanded than supplied, resulting in a shortage of 17 gallons/day.

5. As a result of the BP oil spill (News, p. 58), which of the following changed in the shrimp market (answer yes or no):
(a) Demand?
(b) Supply?
(c) Price? (LO 03-02)

Answers:
(a) No.
(b) Yes.
(c) Yes.

Feedback:
(a) According to the News, the National Oceanic and Atmospheric Administration closed about a third of the Gulf of Mexico to fishing, shrimping, and oystering due to a fear of oil
contamination. The closure caused a decrease in the supply of shrimp, or a leftward supply curve shift, in the marketplace. We must assume demand remained unchanged. 

(b) Supply did change. According to this article, the National Oceanic and Atmospheric Administration closed about a third of the Gulf of Mexico to fishing, shrimping and oystering due to a fear of oil contamination. The closure caused a decrease in the supply of shrimp, or a leftward supply curve shift, in the marketplace. 

(c) Such leftward supply curve shifts push prices up the market demand curve. As the article states, “Large, top-quality white shrimp sell for $7.50 a pound now, compared with $3.50 a pound in January.”

6. Illustrate what’s happening to oil prices in the World View on page 63. (LO 03-04) 
(a) Which curve shifted? 
(b) Which direction did that curve shift (left or right)? 
(c) Did price (A) increase or (B) decrease? 

Answer: 
(a) The supply curve. 
(b) To the left. 
(c) (A) Price increased.

Feedback: According to the World View, oil prices rose due to an expectation of a future decrease in supply. Supply is expected to be restricted due to the likely U.S. sanctions on Russia’s oil exports. In this case, the supply curve is shifting to the left (decreasing) causing the equilibrium price to rise. This article does not discuss any demand shifters (e.g., changes in income).

7. According to Figure 3.8, 
(a) How many organs are supplied at zero price? 
(b) How many people die in the government-regulated economy?
(c) How many people die in the market driven economy? \(\text{(LO 03-05)}\)

**Answers:**

(a) \(q_a\)

(b) The quantity \(q_d - q_a\).

(c) The quantity \(q_d - q_E\).

**Feedback:**

(a) At a price of zero, the quantity supplied is at \(q_a\).

(b) In a government-regulated economy with a price ceiling set at zero, only the quantity \(q_a\) of “altruistic” organs is available. But the quantity \(q_d\) is demanded by all the organ-diseased individuals. The market shortage \(q_d - q_a\) tells us how many patients will die.

(c) The market-driven economy for human organs would deliver the quantity \(q_E\), the output level where quantity demanded is equal to quantity supplied. Consequently, \(q_E\) individuals would receive organs and live. However, the total number of individuals needing an organ (i.e., demanding an organ at the lowest possible price, zero) is \(q_d\). Thus, the number of people who die in a market-driven economy is \(q_d - q_E\).

8. The goal of the price cut described in the News on page 51 was to (select one—enter letter)

(A) Increase supply.

(B) Increase quantity supplied.

(C) Increase demand.

(D) Increase quantity demanded. \(\text{(LO 03-01)}\)

**Answer:** (D) Increase quantity demanded.

**Feedback:** The law of demand predicts that Walmart will sell more Galaxy S4 units (and related two-year service contracts) if it reduces its price. More specifically, the goal of this price cut was to move consumers down the market demand curve by increasing quantity demanded. This is exactly what happened.

9. In Figure 3.8, when a price ceiling of zero is imposed on the organ market, by how much does

(a) The quantity of organs demanded increase?

(b) The demand increase?

(c) The quantity of organs supplied decrease?

(d) The supply decrease? \(\text{(LO 03-05)}\)

**Answers:**

(a) The quantity demanded increases from \(q_E\) to \(q_d\).

(b) The demand for organs doesn’t change.

(c) The quantity supplied decreases from \(q_E\) to \(q_a\).

(d) The supply of organs doesn’t change.
Feedback:
(a) Figure 3.8 shows that $q_E$ people would get transplants in a market-driven system. When a price ceiling of zero is imposed on the organ market through government regulation, more individuals would want organ donations at this lower price (of zero!). Therefore, with the price change, quantity demanded increases from $q_E$ to $q_d$. One of the predictable effects of price ceilings is an increase in quantity demanded.
(b) The imposition of a price ceiling of zero does not change the demand for organs. Price changes move consumers along the market demand curve but do not change or shift the demand curve itself.
(c) Figure 3.8 shows that $q_E$ people would get transplants in a market-driven system. When a price ceiling of zero is imposed on the organ market through government regulation, only the quantity of $q_a$ of transplants can occur. Therefore, with the price change, quantity supplied decreases from $q_E$ to $q_a$.
(d) The imposition of a price ceiling of zero does not change the supply of organs. Price changes move suppliers along the market supply curve but do not change or shift the supply curve itself.

10. Use the following data to draw supply and demand curves on the accompanying graph.

<table>
<thead>
<tr>
<th>Price</th>
<th>$8$</th>
<th>$7$</th>
<th>$6$</th>
<th>$5$</th>
<th>$4$</th>
<th>$3$</th>
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</tr>
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<tbody>
<tr>
<td>Quantity demanded</td>
<td>$2$</td>
<td>$3$</td>
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<td>$6$</td>
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<td>Quantity supplied</td>
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<td>$7$</td>
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</tbody>
</table>

(a) What is the equilibrium price?
(b) If a minimum price (price floor) of $6 is set,
   (i) What kind of disequilibrium situation results?
   (ii) How large is it?
(c) If a maximum price (price ceiling) of $3 is set,
   (i) What kind of disequilibrium situation results?
   (ii) How large is it?
Illustrate these answers. (LO 03-05)

Answers:
(a) $4$.
(b) (i) Surplus.
   (ii) 4 units.
(c) (i) Shortage.
   (ii) 2 units.
Feedback:
(a) Quantity demanded (6) is equal to quantity supplied (6) at a price of $4. Thus equilibrium price is $4.
(b) (i) If a minimum price of $6 is set, a surplus would exist. At this price quantity demanded is less than quantity supplied, or in other words fewer people want the product than are willing produce it.
(ii) At a minimum price of $6, the quantity demanded is 4 units and the quantity supplied is 8 units. Consequently, a surplus of 4 units (8 - 4) exists.
(c) (i) If a maximum price of $3 is set, a shortage would exist. At this price quantity demanded is greater than quantity supplied, or in other words more people want the product than are willing to produce the product.
(ii) At a maximum price of $3, the quantity demanded is 7 units and the quantity supplied is 5 units. A shortage of 2 units (7 - 5) exists at a price of $3.

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