

Review Session Handout #1

Chapter 2: Supply and Demand

Introduction to Microeconomics: Markets, Strategy, and Real-World Cases

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Exercise R1.1. Consider the market for strawberries at a farmers' market. The following schedule lists, at each price per pint, the number of pints buyers want to purchase and the number of pints sellers offer in a day.

Price (per pint)	Quantity demanded (pints)	Quantity supplied (pints)
\$2	80	0
\$3	70	10
\$4	60	20
\$5	50	30
\$6	40	40
\$7	30	50
\$8	20	60
\$9	10	70
\$10	0	80

- (a) Find the equilibrium price and quantity.
- (b) Find the shortage that arises when the price is \$3, and state in which direction the price moves.
- (c) Find the surplus that arises when the price is \$9, and state in which direction the price moves.

Solution.

Part (a). The equilibrium price is the price in the schedule at which the quantity demanded equals the quantity supplied. At \$6 per pint, buyers want 40 pints and sellers offer exactly 40 pints, so the equilibrium price is \$6 and the equilibrium quantity is 40 pints. At every other price in the schedule, the two quantities differ.

Part (b). At \$3, buyers want 70 pints, but sellers offer only 10, a shortage of 60 pints. Buyers who cannot find strawberries offer to pay more, and sellers, seeing eager customers, raise their prices, so the price rises toward \$6.

Part (c). At \$9, sellers offer 70 pints, but buyers want only 10, a surplus of 60 pints. Unsold strawberries pile up, sellers cut their prices to move them, and the price falls toward \$6.

Remark. At any price below \$6, the quantity demanded exceeds the quantity supplied, and the shortage pushes the price up. At any price above \$6, the quantity supplied exceeds the quantity demanded, and the surplus pushes the price down. From either direction, the price moves toward the equilibrium, where quantity demanded equals quantity supplied, the only price at which there is no pressure to change.

Exercise R1.2. A city council votes to ban gas-powered leaf blowers, effective immediately. As a result, demand for electric leaf blowers increases. At the same time, a shortage of semiconductor chips reduces the supply of electric leaf blowers.

Using the three-step method of Section 2.5, which asks (1) whether the event shifts demand, supply, or neither, (2) in which direction the curve shifts, and (3) where the new equilibrium lies, predict what happens to the equilibrium price and quantity of electric leaf blowers. For each variable, state whether its change can be predicted for certain or depends on which shift is larger, and explain why.

Solution.

We apply the three-step method to each event separately, and then combine the results.

Event 1: the ban on gas-powered blowers.

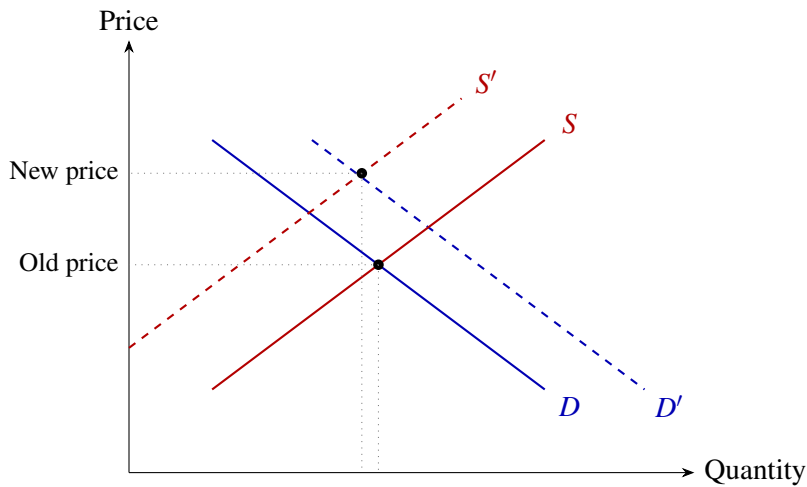
1. The event shifts demand for electric blowers. The ban removes a substitute, gas-powered blowers, from the market, which works like a sharp rise in the price of a substitute (a change in the prices of related goods, Section 2.2.2).
2. Demand shifts to the right, from D to D' : buyers want more electric blowers at every price.
3. Holding supply fixed, the equilibrium price rises and the equilibrium quantity rises.

Event 2: the chip shortage.

1. The event shifts supply. Chips are an input, and the shortage makes them more expensive (a change in input prices, Section 2.3.2).
2. Supply shifts to the left, from S to S' : sellers offer fewer electric blowers at every price.
3. Holding demand fixed, the equilibrium price rises and the equilibrium quantity falls.

Combined effect.

- Price: both events push the price up, so the equilibrium price rises. This change can be predicted for certain.
- Quantity: the demand increase pushes the quantity up, while the supply decrease pushes it down. The change in the quantity depends on which shift is larger: if the demand shift is larger, the quantity rises; if the supply shift is larger, the quantity falls; if both shifts are of the same size, the quantity does not change.



In the figure, the new equilibrium lies above the old one (the price rises) and slightly to its left (the quantity falls slightly), because here the supply shift is the larger of the two. Had the demand shift been larger, the new equilibrium would lie above and to the right of the old one.

Remark. When demand and supply shift at the same time, the change in one variable can be predicted for certain (both shifts push it in the same direction), while the change in the other depends on which shift is larger (the shifts push it in opposite directions). Here the price is the variable we can predict for certain.

Exercise R1.3. The following schedule describes the monthly market for used cars in a state, with quantities in thousands of cars. The “Old” column of quantity demanded applies before a rise in consumer income, and the “New” column applies after it. Used cars are a normal good for these buyers, and the supply of used cars does not change.

Price	Old quantity demanded	New quantity demanded	Quantity supplied
\$10,000	70	100	40
\$11,000	65	95	50
\$12,000	60	90	60
\$13,000	55	85	70
\$14,000	50	80	80
\$15,000	45	75	90
\$16,000	40	70	100

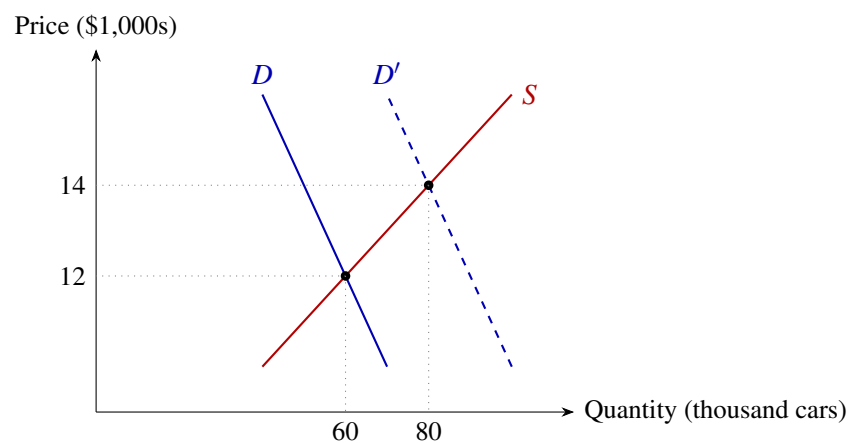
- Find the equilibrium price and quantity before the rise in income.
- Find the new equilibrium price and quantity after the rise in income.
- By how much do the equilibrium price and the equilibrium quantity change? Explain the direction of each change.

Solution.

Part (a). Before the rise in income, the old quantity demanded equals the quantity supplied at \$12,000, where buyers want 60 thousand cars and sellers offer 60 thousand. The equilibrium price is \$12,000 and the equilibrium quantity is 60,000 cars a month.

Part (b). After the rise in income, buyers want 30 thousand more cars at every price. The new quantity demanded equals the quantity supplied at \$14,000, where both equal 80 thousand cars. The new equilibrium price is \$14,000 and the new equilibrium quantity is 80,000 cars a month. At the old price of \$12,000, buyers now want 90 thousand cars while sellers offer only 60 thousand, a shortage of 30 thousand cars that pushes the price up.

Part (c). The price rises by \$2,000, from \$12,000 to \$14,000, and the quantity rises by 20,000 cars, from 60,000 to 80,000 a month. Both rise, as Table 2.5 predicts for an increase in demand. Intuitively, buyers with higher incomes compete for the available cars and bid the price up, and the higher price brings out the extra cars they now want.



Remark. An increase in income shifts the demand for a normal good to the right and raises both the equilibrium price and the equilibrium quantity, while the supply curve stays put and the market moves along it. How the change splits between the price and the quantity depends on how responsive sellers are: if the quantity supplied responded less to the price (a steeper supply curve), the same increase in demand would raise the price by more and the quantity by less. Chapter 3 measures this responsiveness.