

Cosumnes River College
Principles of Microeconomics
Problem Set 2
Due February 8, 2017

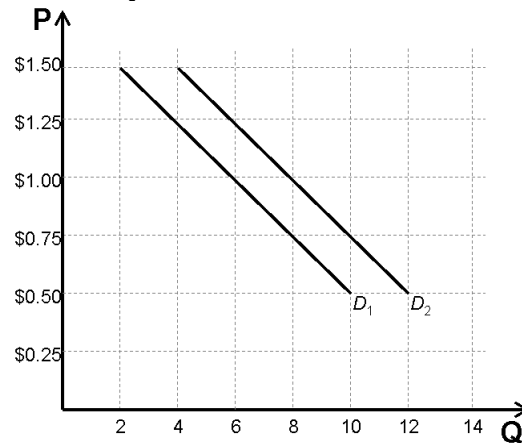
Spring 2015

Prof. Dowell

Instructions: Write the answers clearly and concisely on these sheets in the spaces provided. Do not attach additional sheets.

1. Draw a *demand curve* from the following demand table on the axes below. Label it D_1 . Then suppose the demander gets an increase in income and decides to buy 2 more bars at every price level. Draw this change on your demand curve. Label it D_2 .

Price per candy bar	Candy bars purchased each week
\$0.50	10
0.75	8
1.00	6
1.25	4
1.50	2



2. Fill in the blanks in the following sentences:
- If the price of a good or service falls, the quantity demanded increases.
 - The quantity of a good or service purchased at each price is given by the demand curve.
 - The quantity of a good or service offered for sale at each price is given by the supply curve.
 - The laws of supply and demand say that at the equilibrium price the quantity demanded equals the quantity supplied.
 - An increase in the price of a good leads to a movement along its demand curve.
 - A change in technology leads to a shift of the supply curve.
 - In an economic equilibrium, there are no forces for change.
 - The statement that market supply equals market demand is an example of an equilibrium relationship.

3. Indicate whether each of the following statements describes an increase in demand, decrease in demand, change in quantity demanded, increase in supply, decrease in supply, or change in quantity supplied in the given market.

- a. Store-brand soup prices are cut, reducing sales of Campbell's soup. Market: Campbell's soup.

Change (decrease) in demand

- b. Coffee bean prices hit an 18-month low following a bountiful harvest. Market: coffee beans.

Change (increase) in supply

- c. A summer heat wave leads to higher prices for bottled water. Market: bottled water.

Change (increase) in demand

- d. Holiday clothing discounts boost clothing sales. Market: clothing.

Change (increase) in quantity demanded

- e. Apple introduces a tinier and more powerful iPod model. Market: older iPod models.

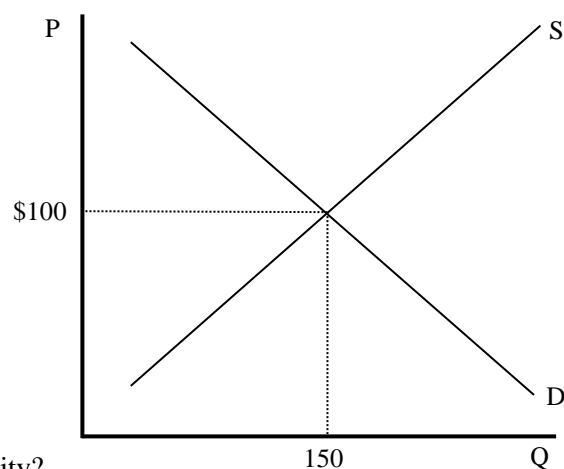
Change (decrease) in demand

- f. The cost of pesticides increases, leading to a rise in the price of soy beans. Market: soy beans.

Change (decrease) in supply

2. Use the information in the table below to draw the supply and demand curves for color printers: (Be sure to clearly label the axes.)

Price	Quantity Demanded	Quantity Supplied
\$50	200	50
\$100	150	150
\$150	100	250
\$200	50	350

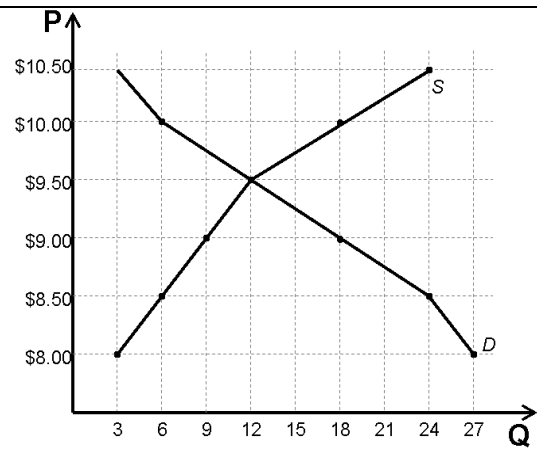


- a. What is the equilibrium price and quantity?
 $P = \$100, Q = 150$
- b. If the price were \$150.00, would there be a shortage or a surplus? How big would it be?
A surplus of 150 because at a price of \$150, $Q^S = 250$ while $Q^D = 100$.
- c. Explain why a price of \$150 can't be an equilibrium. (What would happen if the price were \$150?)

A price of \$150 can't be an equilibrium because at this price $Q^S > Q^D$. Suppliers will reduce prices to clear the market. Quantity supplied will decrease while quantity demanded will increase.

5. State the effect of the following events on equilibrium price and quantity of the market given.
- Beetle infestation decimates tobacco crop. Market: cigars.
This reduces supply so equilibrium price rises, and equilibrium quantity declines.
 - The Organization for Petroleum Export Countries raises oil export quotas. Market: gasoline.
This increases supply so equilibrium price falls, and equilibrium quantity increases.
 - Digital image albums become the rage among households while improved technology reduces the cost of producing digital cameras. Market: digital cameras.
This increases both demand and supply so equilibrium quantity increases while the effect on price is uncertain.
 - Hurricanes in the Gulf coast cause gasoline supply disruptions while the summer travel season ends. Market: gasoline.
This decreases both demand and supply so equilibrium quantity decreases while the effect on price is uncertain.
6. Given the following data for individuals, draw the market demand curve and market supply curve for CDs. Assume that these are the only individuals in the entire market. Price is per CD.

Price	\$8.00	\$8.50	\$9.00	\$9.50	\$10.00	\$10.50
Quantity demanded in units per week						
Mark	3	3	1	0	0	0
Lynn	8	7	6	3	2	1
Jason	6	5	4	3	0	0
Erin	10	9	7	6	4	2
Quantity supplied in units per week						
Jeff	0	1	2	3	4	6
Beth	2	3	3	4	6	7
Chris	0	1	2	3	5	6
Abby	1	1	2	2	3	5



- What would be the equilibrium price and quantity in this market?
Equilibrium price is \$9.50 and equilibrium quantity is 12 CDs.
- Which would there be—excess demand or excess supply—at a price of \$8.00? How much? What about at a price of \$10.00?
At a price of \$8.00, there would be excess demand of 24 CDs; at a price of \$10.00, there would be excess supply of 12 CDs.
- If the price of a CD was initially set at \$9.00 but the price was allowed to adjust, would the price rise or fall? Explain your answer.
If the price were \$9.00, there would be pressure on the price to rise because of the excess demand.

7. The demand and supply curves for hotdogs in Sacramento are given by the following two equations:

$$Q^D = 8,000 - 800P$$

$$Q^S = 2,000 + 200P,$$

where P is the price measured in dollars and Q^D is the number of hotdogs demanded and Q^S is the number of hotdogs supplied.

- a. Find the equilibrium price and quantity.

To solve, set Q^D equal to Q^S and solve for P .

$$8,000 - 800P = 2,000 + 200P$$

$$6,000 = 1,000P$$

$$P = 6$$

Now, plug the value of P back in and solve for quantity.

$$Q^D = 8,000 - 800(6) = 3,200$$

$$Q^S = 2,000 + 200(6) = 3,200$$

- b. If students suddenly acquire a greater taste for hotdogs, which of the following might be the new demand curve? Circle it.

$$Q^D = 6,500 - 800P$$

$$Q^D = 9,500 - 800P$$

This is an increase in demand. We want the demand curve with the larger intercept.

Find the equilibrium price and quantity after the shift of the demand curve.

Again, to solve, set Q^D equal to Q^S and solve for P .

$$P = 7.50$$

Now, plug the value of P back in and solve for quantity.

$$Q^D = Q^S = 3,500$$

- c. If instead one of the stores selling hotdogs goes out of business, which of the following might be the new supply curve? Circle it.

$$Q^S = 1200 + 200P$$

$$Q^S = 2800 + 200P$$

This reduces supply so we want the supply curve with the smaller intercept.

Find the equilibrium price and quantity after the shift of the supply curve.

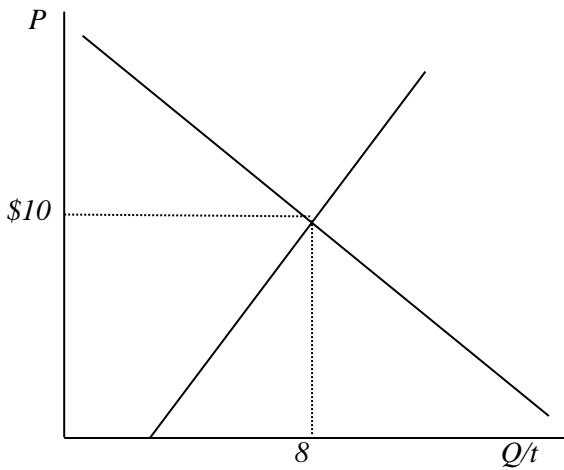
Again, to solve, set Q^D (from part a) equal to new Q^S and solve for P .

$$P = 6.80$$

Now, plug the value of P back in and solve for quantity.

$$Q^D = Q^S = 2,560$$

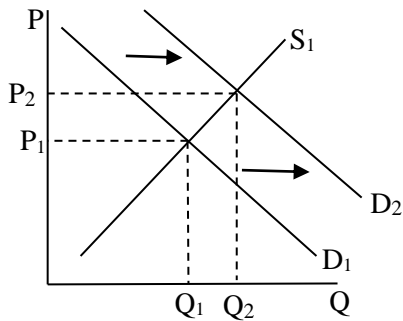
8. Suppose the market demand and supply curves for mead are given by the equations $Q_D = 38 - 3P$ and $Q_S = P - 2$. Solve for the equilibrium price and quantity. Represent the equilibrium on the axes below using a properly labeled supply and demand diagram.



$$\begin{aligned} \text{Set } Q_D &= Q_S = P - 2. \\ 38 - 3P &= P - 2 \\ 40 &= 4P \\ P &= 10 \Rightarrow Q_D = 8 \text{ and } Q_S = 8 \end{aligned}$$

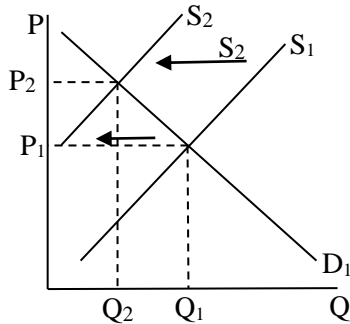
- For each of the following events, show the resulting shift in the supply and or demand curve and label the new equilibrium quantity as Q_2 and the new equilibrium price P_2 . Also, in words, and using the terminology discussed in class, describe what happens.

- a. an increase in the income in the market for a normal good



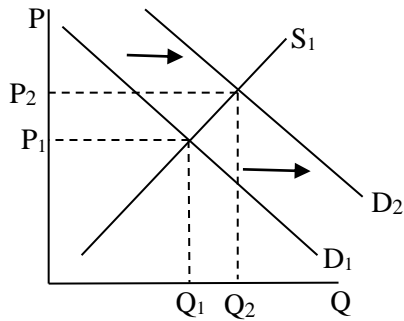
Demand and quantity supplied both increase. Equilibrium quantity and price also both increase.

- b. an increase in the price of an input



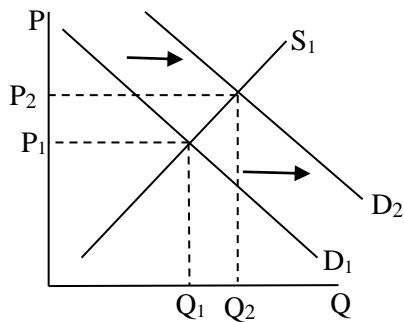
Supply and quantity demanded both decrease. Equilibrium quantity decreases and equilibrium price increases.

c. an increase in the price of a substitute



Demand and quantity supplied both increase. Equilibrium quantity and price also both increase.

d. a decrease in the price of a complement



Demand and quantity supplied both increase. Equilibrium quantity and price also both increase.

10. For each of the following transactions, state the effect both on U.S. GDP and on the individual components of aggregate expenditure:

- You buy a new car from a U.S. producer.
Consumption and GDP both increase.
- You buy a new car imported from Germany
Consumption and imports both increase. There is no change in GDP.
- Your family's rental car business buys a new car from an American producer.
Investment and GDP both increase.
- Your family's rental car business buys a new car imported from Korea.
Investment and imports both increase. There is no change in GDP

11. Explain what double counting is and discuss why GDP is not equal to total sales.

Double counting occurs when intermediate goods are counted directly in calculating GDP. This means these intermediate goods will be counted more than once because they are also counted as part of the value of the final product. Total sales includes sales of intermediate goods that firms sell to each other. GDP includes only the sales of final goods and services.

12. Larson has started a home wine –making business and he buys all his ingredients from his neighborhood farmers’ market and a local bottle manufacturer. Last year he purchased \$4,000 worth of ingredients and bottles and produced 2,000 bottles of wine. He then sold all 2,000 bottles of wine to a restaurant for \$10 each. The restaurant sold all the bottles of wine to customers for \$45 each.

a. For the total wine production, calculate the value added by Larson.

$$\text{Value added} = \text{sales price less costs} = (\$10 \times 2,000) - \$4,000 = \$20,000 - \$4,000 = \mathbf{\$16,000}$$

b. For the total wine production, calculate the value added by the restaurant.

$$(\$45 \times 2,000) - \$20,000 = \$90,000 - \$20,000 = \mathbf{\$70,000}$$

13. You are given the following data for a hypothetical economy:

Spending Component	Value (billions of dollars)
Personal Consumption Expenditure	\$600
Exports	75
Government Purchases of Goods and Services	200
Construction of New Homes and Apartments	100
Sale of Existing Homes and Apartments	200
Imports	50
Beginning of Year Inventory	100
End of Year Inventory	125
Business Fixed Investment	100
Government Payments to Retirees	100
Beginning of Year Capital Stock	3,000
End of Year Capital Stock	3,175

Showing your work, complete the following:

a. Calculate GDP for this economy. Also explain what you are doing and why.

Using the expenditure approach, add up personal consumption, investment, government spending and net exports. To get investment, add new home construction, business fixed investment and the change in inventory. Sale of existing homes is not included because they were not produced in the current year. Government payments to retirees are excluded because it is a transfer payment. Beginning and ending capital stocks are not included because they are stock variables. They tell us how much capital we own, not what we’ve produced in the current year. Note that with respect to inventories, we include only the change, not the level. Adding up, you get

$$Y = 600 + 225 + 200 + (75 - 50) = \mathbf{1,050}$$

b. Calculate net investment.

Net investment is just the change in the capital stock or $3,175 - 3,000 = \mathbf{175}$

- c. Calculate Net Domestic Product (NDP).
First, calculate depreciation. Use the relation, Net Investment = Gross Investment – Depreciation. We know the values of Gross and Net Investment. Substitute these and solve.

$$175 = 225 - \text{Depreciation} \Rightarrow \text{Depreciation} = 50. \text{ Use this to find NDP: } \text{NDP} = 1,050 - 50 = 1,000$$

- d. Is NDP less than GDP? If yes, why? Explain.
Yes, NDP is less than GDP because of depreciation. Some of the gross investment in GDP went to replace capital that is worn out or obsolete.

14. Suppose the data below represents the economic activity of a country in 2010:

Spending (or income) Component	Value (billions of dollars)
Consumption	\$140
Business Fixed and Residential Construction	\$27
Inventory Stock at the end of 2009	\$10
Inventory Stock at the end of 2010	\$5
Depreciation	\$12
Government Spending	\$80
Government Purchases	\$65
Exports	\$21
Imports	\$17
Labor Income	\$126
Capital Income	\$70
Net Income of Foreigners	\$5
Taxes, Subsidies and Transfers	\$28

Showing your work, complete the following:

- a. Calculate inventory investment.

$$\text{Inventory Investment} = \text{Inventory}_{2010} - \text{Inventory}_{2011} = \$5 - 10 = -5$$

- b. Calculate net exports.

$$NX = X - M = 21 - 17 = 4$$

- c. Calculate gross domestic product.

$$\text{First calculate total Investment: } \text{Investment} = \text{Business Fixed Investment} + \text{New Residential Construction} + \text{Change in Inventory} = 27 - 5 = 22$$

$$\text{Then, } Y = C + I + G + NX = 140 + 22 + 65 + 4 = 231$$

- d. Calculate the statistical discrepancy.

The statistical discrepancy is the difference between GDP calculated using the income approach and GDP calculated using the income approach. GDP

First, calculate GDP using the income approach:

GDP = income (where income = capital income + labor income) + depreciation + sales tax, indirect business tax and subsidies + net income of foreigners

$$= \$70 + \$126 + \$12 + \$28 + \$5 = \$241 .$$

The statistical discrepancy then is $\$231 - \$241 = \$-10$

- e. Calculate national saving.

National Saving is defined as GDP less consumption and government spending.

$$S = Y - C - G = \$231 - \$140 - \$65 = \$8$$