

B ECON 300

Managerial Economics

Quiz Session

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By means of introduction...



2002 **Microsoft** | Volume Licensing

2004 **Microsoft** | Services

2007 **Microsoft** | Volume Licensing

2009 **Microsoft** |



Entered Law School in 1996
B. Sc. Computer Sciences – 2000



MBA – 2010
Ph.D. Finance (2014?)

My plan for these help sessions

- I repeat the Tuesday session on Friday
 - You don't need to attend both unless you want to ask something
- I plan to do a lot of problems on the board
- I plan to answer your questions

I can change my plans as needed, but **you** have to let me know.

Chapter 2

DEMAND, SUPPLY AND MARKET EQUILIBRIUM

The General Demand Function

The general demand function can be expressed as:

$$Q_d = f(P, M, P_R, \mathcal{T}, P_e, N)$$

Where:

P – (own price) price of the good for which we are estimating the demand

M – income

P_R – price of related goods

\mathcal{T} – tastes

P_E – expected future prices

N – number of consumers

The General Supply Function

The general supply function can be expressed as:

$$Q_S = f(P, P_I, P_R, T, P_e, F)$$

Where:

P – (Own price) price of the good for which we are estimating the supply

P_I – price of inputs

P_R – price of related goods

T – technology

P_E – expected future prices

F – number of firms

Cheat Sheet - Demand

Demand			
Variable		Sign is	
Name	Symbol	negative (-)	positive (+)
Price	P	Always	Never
Income	M	Inferior good	Normal good
Price of related good	P_r	Complement	Substitute
Taste	\mathcal{T}	Never	Always
Expected future prices	P_e	Never	Always
Number of consumers	N	Never	Always

Cheat Sheet - Supply

Supply			
Variable		Sign is	
Name	Symbol	negative (-)	positive (+)
Price	P	Never	Always
Price of inputs	P_i	Always	Never
Price of related goods	P_r	Substitute	Complement
Technology	T	Never	Always
Expected future prices	P_e	Always	Never
Number of firms	F	Never	Always

What moves where?

		Demand	
		LEFT	RIGHT
Supply	LEFT	Quantity moves left Price indeterminate	Quantity indeterminate Price goes up
	RIGHT	Quantity indeterminate Price goes down	Quantity moves right Price indeterminate

Note that the demand tells you the direction that the variable will shift. Also, note that if both supply and demand move in the **same direction**, you can tell what happens to **quantity**. If they move in **opposite directions**, you can tell what happens to **price**.

Supply and Demand – Conceptual

Increases or Decreases?

What happens to the demand for Sony color television sets when each of the following changes occurs?

- _____ a. The price of Zenith color television sets rises.
- _____ b. The price of a Sony rises.
- _____ c. Personal income falls (color televisions are normal goods).
- _____ d. Technological advances result in dramatic price reductions for video tape recorders.
- _____ e. Congress is persuaded to impose tariffs on Japanese television sets starting next year.

Supply and Demand – Conceptual

Increases or Decreases?

What happens to the supply of random access memory (RAM) chips, a component in the manufacture of personal computers, when each of the following changes occurs?

- _____ a. Two huge new manufacturing plants begin operation in South Korea.
- _____ b. Scientists discover a new production technology that will lower the cost of making RAM chips.
- _____ c. The price of silicon, a key ingredient in RAM chip production, rises sharply.
- _____ d. The price of RAM chips increases.
- _____ e. The market for personal computers turns sour and RAM chip makers now expect RAM chip prices to fall by 25 percent next quarter.

Supply and Demand – Conceptual

The following events occur simultaneously:

- (i) Scientists at Texas A&M University discover a way to triple the number of oranges produced by a single orange tree.
- (ii) The *New England Journal of Medicine* publishes research results that show “conclusively” that drinking orange juice reduces the risk of heart attack and stroke by 40 percent.

Which variable (quantity or price) can we determine?

What happens with it?

Answers

Supply

- a. Demand increases (shifts rightward)
- b. Nothing happens to Sony demand; demand does not shift. Quantity demanded, however, decreases.
- c. Demand decreases (shifts leftward)
- d. Demand increases (shifts rightward)
- e. Demand in the current time period increases (shifts rightward) since consumers expect price to be higher next year.

Demand

- a. Supply increases (shifts rightward)
- b. Supply increases (shifts rightward)
- c. Supply decreases (shifts leftward)
- d. Nothing happens to RAM chip supply; supply does not shift. Quantity supplied, however, increases.
- e. Supply in the current time period increases (shifts rightward) as producers increase production in the current time period to sell more chips at a price that is higher relative to the price they expect to receive in the next quarter.

Simultaneous shift

The simultaneous increase in demand and supply cause equilibrium quantity to increase, but equilibrium price of orange juice could rise, fall, or stay the same depending on the magnitudes of the shifts in demand and supply. Thus, the predicted change in the price of orange juice is indeterminate.

Supply and Demand – A Short Problem

Consider the following demand and supply functions for tomatoes:

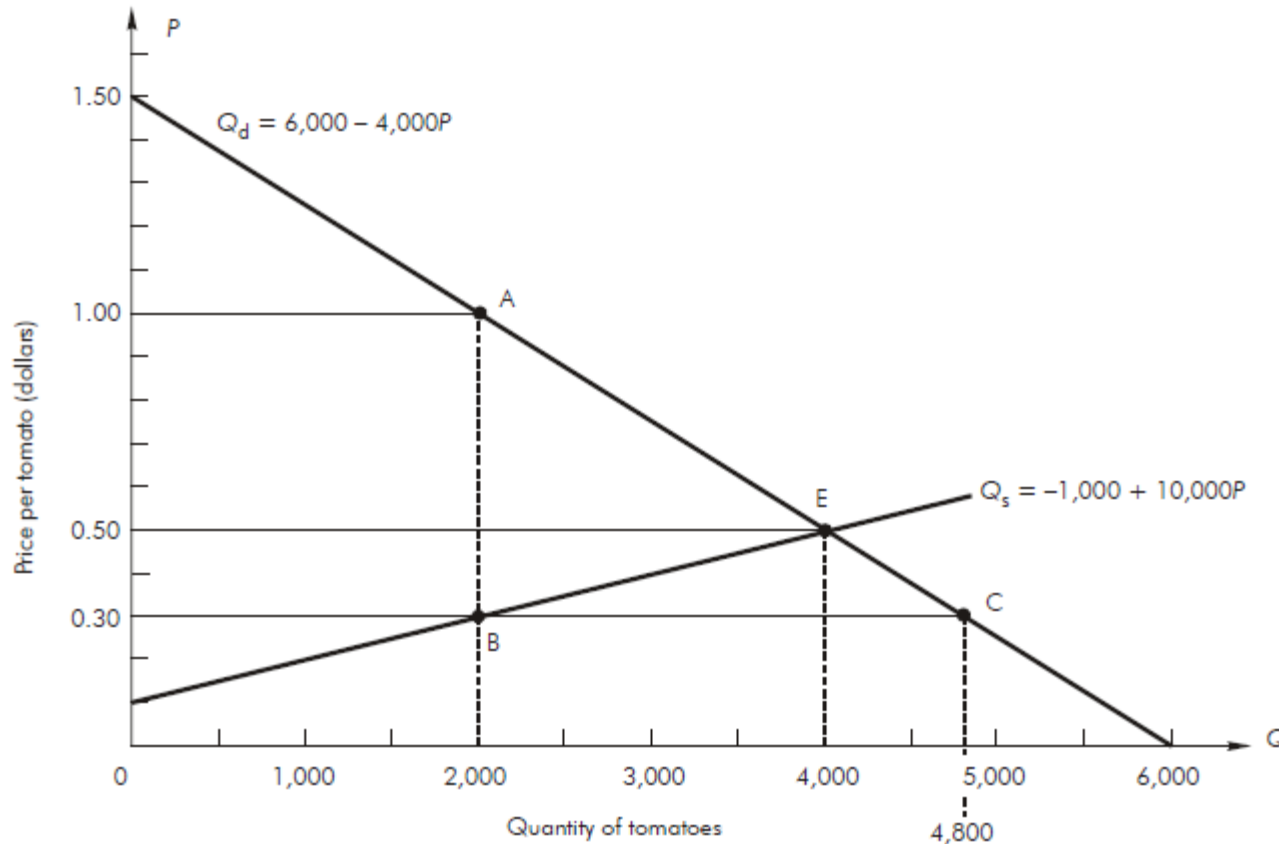
$$Q_d = 6,000 - 4,000P$$

$$Q_s = -1,000 + 10,000P$$

- Plot the demand and supply functions on the axes below.
- At a price of \$1.00 per tomato, _____ tomatoes is the maximum amount that can be sold. A price of \$ _____ per tomato is the maximum price that consumers will pay for 2,000 tomatoes, which is the demand price for 2,000 tomatoes.
- The maximum amount of tomatoes that producers will offer for sale if the price of tomatoes is \$0.30 is _____. The minimum price necessary to induce producers to offer voluntarily 2,000 tomatoes for sale is \$ _____, which is called the supply price for 2,000 tomatoes.
- In equilibrium, the price of tomatoes is \$ _____ and _____ tomatoes will be sold.
- In equilibrium, the quantity of tomatoes produced is _____ tomatoes.
- In equilibrium, the quantity of tomatoes consumed is _____ tomatoes.
- Are your answers to parts *e* and *f* the same? Why or why not?
- Congress imposes a \$0.30 per tomato ceiling price on tomatoes. This results in a _____ (surplus, shortage) of _____ tomatoes.

Answer

a. Your demand and supply curves should look like this:



- b. 2,000 ($= 6,000 - 4,000 \times 1.00$) see point A; \$1
- c. 2,000 ($= -1,000 + 10,000 \times 0.30$) see point B; \$0.30
- d. \$0.50; 4,000 (see point E)
- e. 4,000
- f. 4,000
- g. Yes, in equilibrium quantity consumed equals quantity produced ($Q_d = Q_s$).
- h. Shortage; 2,800. Notice that at \$0.30, quantity demanded is 4,800 ($= 6,000 - 4,000 \times 0.30$), and quantity supplied is 2,000 ($= -1,000 + 10,000 \times 0.30$). Thus, the shortage is 2,800 ($= 4,800 - 2,000$).

Supply and Demand – A Long Problem

Consider the market for new, single-family homes in New Orleans. The general demand function for new housing in New Orleans is estimated to be

$$Q_d = 15 - 2P + 0.05M + 0.10R$$

where Q_d is the monthly quantity demanded, P is the price per square foot, M is average monthly income in New Orleans, and R is the average monthly rent for a three-bedroom apartment in New Orleans. Q_d is measured in units of 1,000 square feet per month.

The general supply function for new housing in New Orleans is estimated to be

$$Q_s = 96 + 2P - 10P_L - 4P_K$$

where P is the price per square foot of new housing in New Orleans, P_L is the average hourly wage rate for construction workers, and P_K is the price of capital (as measured by the average rate of interest paid on loans to home builders). Q_s is measured in units of 1,000 square feet per month.

New Orleans Housing - Demand

New housing in New Orleans is a(n) _____ (normal, inferior) good. How can you tell from the general demand function?

New housing and three-bedroom apartments are _____ (substitutes, complements) in New Orleans. How can you tell from the general demand function?

If average monthly income is \$1,500 and the monthly rental rate for three-bedroom apartments is \$700, then the demand function for new housing in New Orleans is

$$Q_d = \underline{\hspace{10em}}.$$

New Orleans Housing - Supply

Does it make sense for P_L and P_K to have negative coefficients in the general supply function? Explain why or why not.

If the average hourly wage rate for construction workers is \$10 per hour and the average rate of interest on loans to builders is 9 percent (i.e., $P_K = 9$), then the supply function for new housing is

$$Q_s = \underline{\hspace{10em}}.$$

New Orleans Housing - Equilibrium

Solve mathematically for equilibrium price and quantity. Show your work:

$$P_E = \$ \underline{\hspace{2cm}} \text{ per square foot.}$$

$$Q_E = \underline{\hspace{2cm}} \text{ square feet per month (in 1,000s).}$$

New Orleans Housing – Equilibrium (cont.)

Suppose New Orleans suffers a serious recession that causes average monthly income to fall from \$1,500 to \$1,100 per month. If other things remain the same, the demand for new housing in New Orleans is now:

$$Q_d = \underline{\hspace{4cm}}.$$

Suppose that because of the recession in New Orleans, the wage rate for construction workers falls to \$8 per hour. If other things remain the same, the supply of new housing in New Orleans is now:

$$Q_s = \underline{\hspace{4cm}}.$$

After income falls to \$1,100 and wages fall to \$8, new equilibrium price and quantity are

$$P_E = \$ \underline{\hspace{2cm}} \text{ per square foot}$$

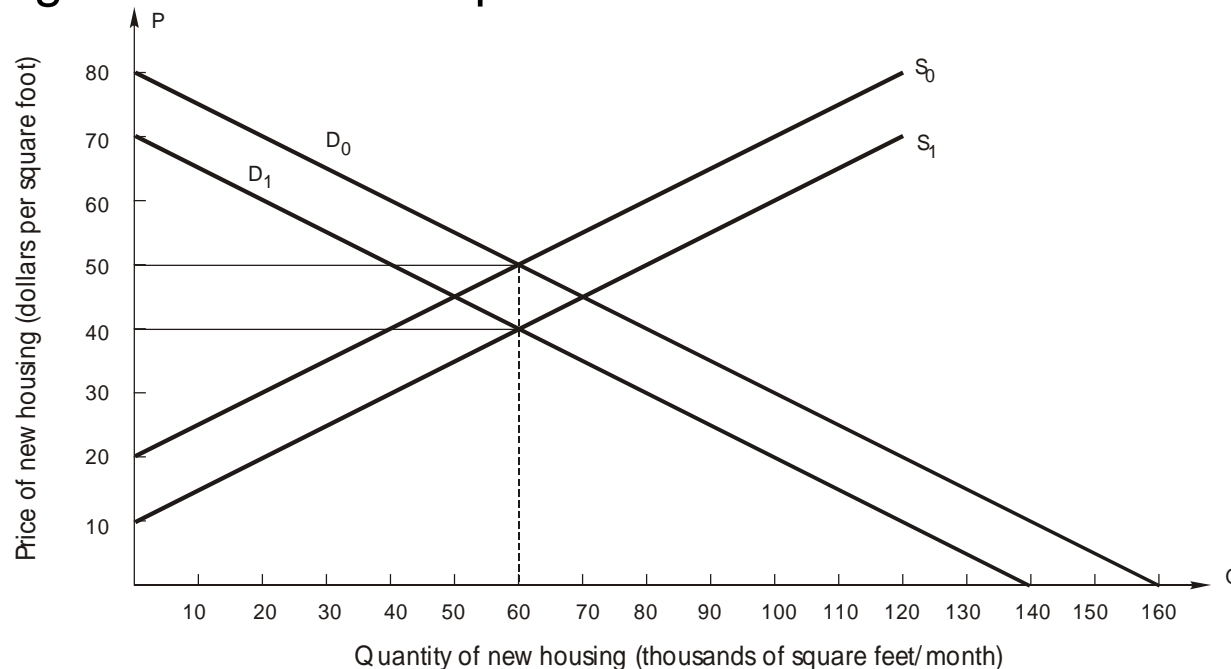
$$Q_E = \underline{\hspace{2cm}} \text{ square feet per month (in 1,000s)}$$

New Orleans Housing – Social Surplus

- Compute the consumer surplus
- Compute the producer surplus
- Compute the social surplus

Answers – New Orleans Problem (1/2)

- Normal. The coefficient on M is positive. Thus is positive and housing is a normal good.
- Substitutes. The coefficient on R is positive. Thus is positive, and three-bedroom apartments are substitutes for new housing.
- $Q_d = 160 - 2P$
- Figure for the whole problem:



Answers – New Orleans Problem (2/2)

- Yes, because an increase in a factor/input price should cause Q_s to get smaller (i.e., is negative).
- $Q_s = -40 + 2P$
- $P_E = \$50$ and $Q_E = 60$
- Yes; yes.
- $Q_d = 140 - 2P$
- $Q_s = -20 + 2P$
- $P_E = \$40$ and $Q_E = 60$
- $CS = .5 \times 60 \times (\$80 - \$50) = \900 ; $PS = .5 \times 60 \times (\$50 - \$20) = \900 ; $SS = \$1,800$