

AP MACRO ECONOMICS

MR. LIPMAN

KRUGMAN SECTION 2
SUPPLY AND DEMAND
MODULES 5-9
PAGES 47-93

5 KEY ELEMENTS TO SUPPLY & DEMAND

- THE DEMAND CURVE
- THE SUPPLY CURVE
- FACTORS THAT CAUSE CURVES TO SHIFT
- MARKET EQUILIBRIUM
- HOW MARKET EQUILIBRIUM CHANGES WHEN SUPPLY OR DEMAND CURVE **“SHIFTS”**

calvin and HOBBS

BY WATTERSON

15 BUCKS
A GLASS?!

THAT'S RIGHT!
WANT SOME?



HOW DO YOU
JUSTIFY CHARGING
15 DOLLARS?!

SUPPLY AND
DEMAND.



WHERE'S THE
DEMAND?!
I DON'T SEE
ANY DEMAND!

THERE'S *LOTS*
OF DEMAND!



YEAH?

SURE! AS THE SOLE
STOCKHOLDER IN THIS
ENTERPRISE, I **DEMAND**
MONSTROUS PROFIT ON
MY INVESTMENT!



AND AS PRESIDENT AND CEO OF
THE COMPANY, I **DEMAND** AN
EXORBITANT ANNUAL SALARY!



AND AS MY OWN EMPLOYEE, I
DEMAND A HIGH HOURLY WAGE
AND ALL SORTS OF COMPANY BENEFITS!
AND **THEN** THERE'S OVERHEAD AND
ACTUAL PRODUCTION COSTS!



BUT IT LOOKS LIKE YOU JUST THREW A LEMON IN SOME SLUDGE WATER!

WELL, I HAVE TO CUT EXPENSES *SOMEWHERE* IF I WANT TO STAY COMPETITIVE.



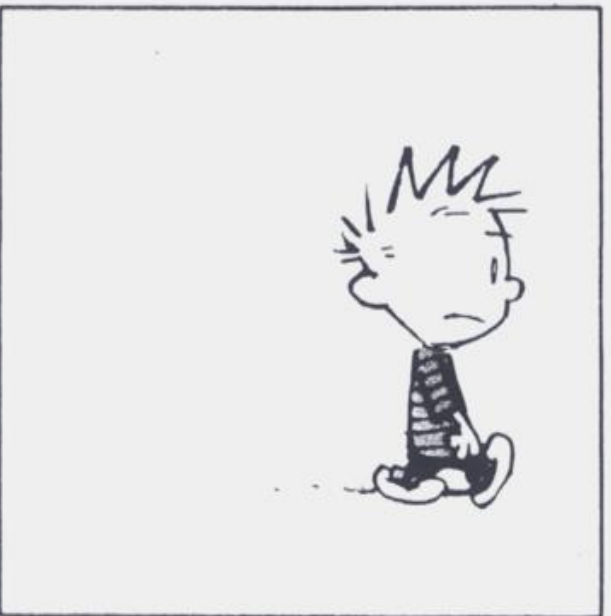
WHAT IF I GOT SICK FROM THAT?

"CAVEAT EMPTOR" IS THE MOTTO WE STAND BEHIND! I'D HAVE TO CHARGE MORE IF WE FOLLOWED HEALTH AND ENVIRONMENTAL REGULATIONS.



YOU'RE OUT OF YOUR MIND. I'M GOING HOME TO DRINK SOMETHING ELSE.

SURE! PUT ME OUT OF A JOB! IT'S YOU ANTI-BUSINESS TYPES WHO RUIN THE ECONOMY!



I NEED TO BE SUBSIDIZED.



Demand is the different quantities of goods that consumers are **willing and **able** to buy at different prices.**

(Ex: Bill Gates is able to buy a Ferrari, but if he isn't willing to then he has NO demand for one)

The law of demand states there is an INVERSE relationship between price and quantity demanded :

AS PRICE GOES UP THE QUANTITY DEMANDED WILL DROP & AS PRICE DROPS DEMAND RISES

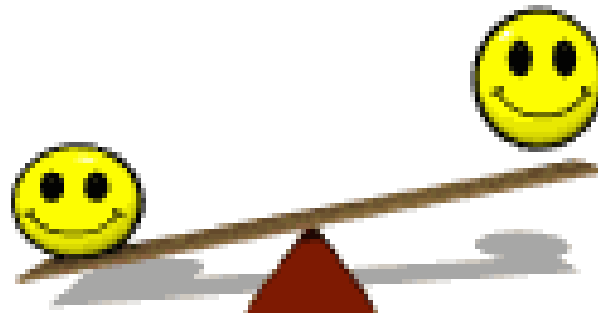
As Price Falls...

...Quantity Demanded Rises

As Price Rises...

...Quantity Demanded Falls

Price



**Quantity
Demanded**

The law of demand is the result of three (3) separate behavior patterns that overlap:

1.The Substitution effect

2.The Income effect

3.The Law of Diminishing Marginal Utility



1. The Substitution Effect

- If the price goes up for a product, consumers buy less of that product and more of another substitute product (and vice versa)



2. The Income Effect

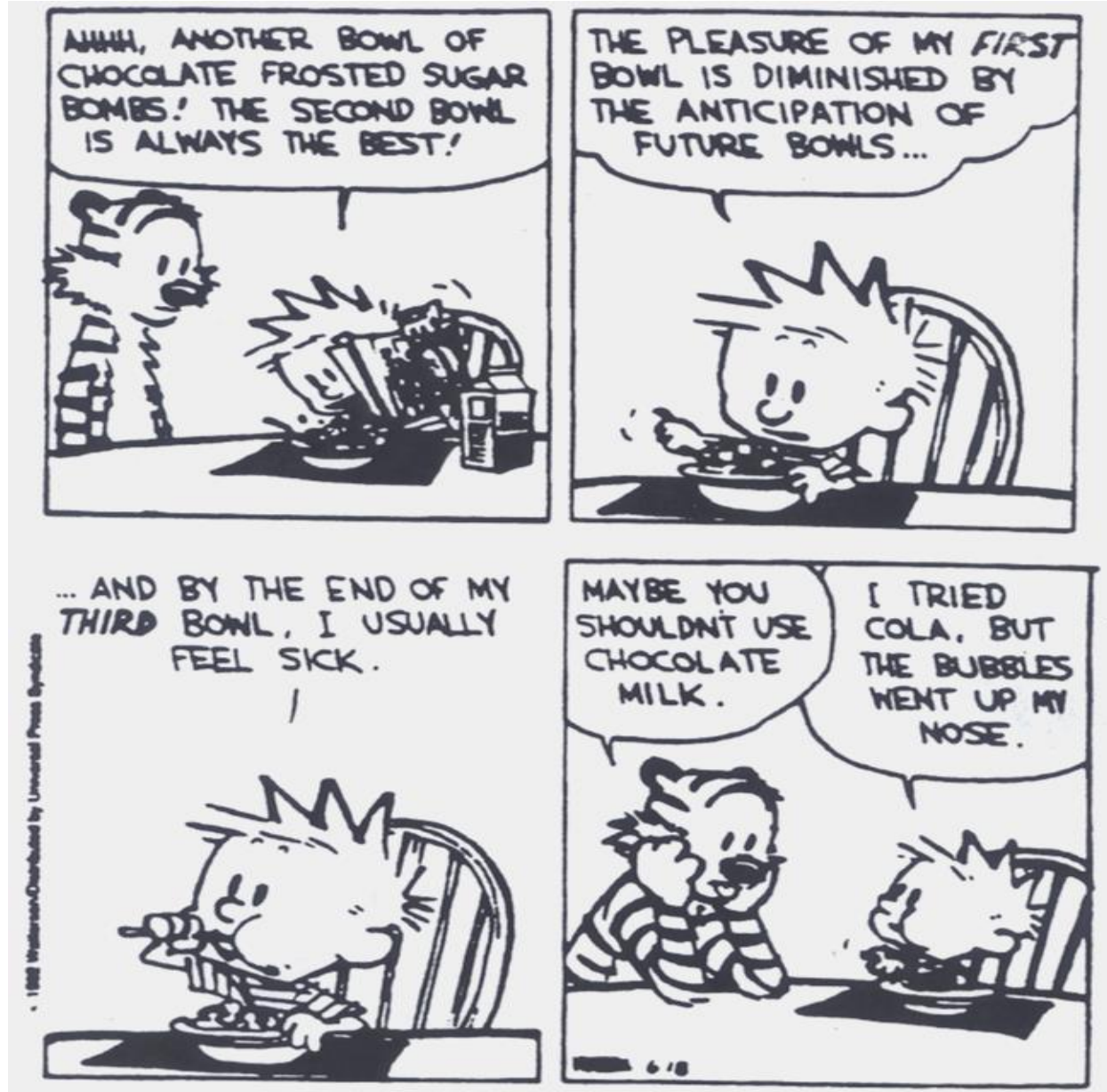
- If the price goes down for a product, the purchasing power increases for consumers -allowing them to purchase more.



3. Law of Diminishing Marginal Utility

- **Utility = Satisfaction**
- The **law of diminishing marginal utility** states that as you consume more units of any good, the additional satisfaction from each additional unit will eventually start to decrease
- In other words, the more you buy of ANY GOOD the less satisfaction you get from each new unit of that good.

The Law of Diminishing Marginal Utility





Disneyland's pricing strategy is another example of marginal utility (law of diminishing demand)

Theme Park Tickets	Ages 3-9	Ages 10+	Change
<u>1-Day Park Hopper® Ticket</u>	\$87.00	\$97.00	N/A
<u>2-Day Park Hopper® Ticket</u> Valid now thru January 3, 2011.	\$131.00	\$151.00	\$54
<u>3-Day Park Hopper® Bonus Ticket</u> Save up to \$20 per person when you buy online!	\$174.00 \$154.00	\$204.00 \$184.00	\$33
<u>4-Day Park Hopper® Bonus Ticket</u> Save up to \$30 per person when you buy online!	\$199.00 \$169.00	\$229.00 \$199.00	\$15
<u>5-Day Park Hopper® Bonus Ticket</u> Save up to \$40 per person when you buy online!	\$249.00 \$179.00	\$249.00 \$209.00	\$10
<u>6-Day Park Hopper® Bonus Ticket</u> Save up to \$40 per person when you buy online!	\$224.00 \$184.00	\$254.00 \$214.00	\$5

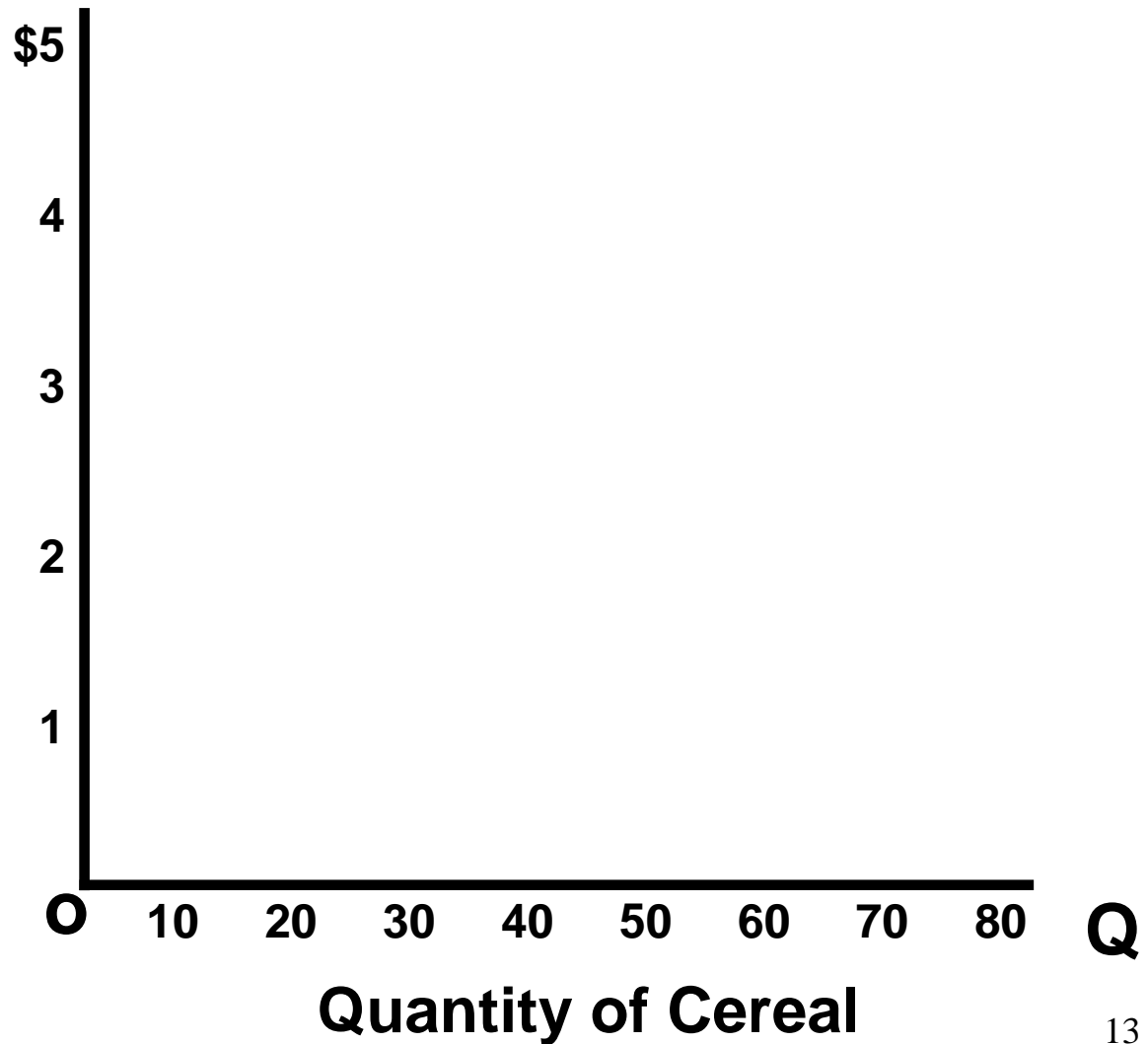
- A **demand curve** is a graphical representation of a demand schedule or table.
- The demand curve is downward sloping showing the inverse relationship between **price** (always on the y-axis) & **quantity** demanded (always on the x-axis)
- When reading a demand curve, assume all outside factors, such as income, weather, etc. are held constant or equal (*ceteris paribus*)

GRAPHING DEMAND FOR CALVIN'S CEREAL

Demand Schedule

Price of Cereal

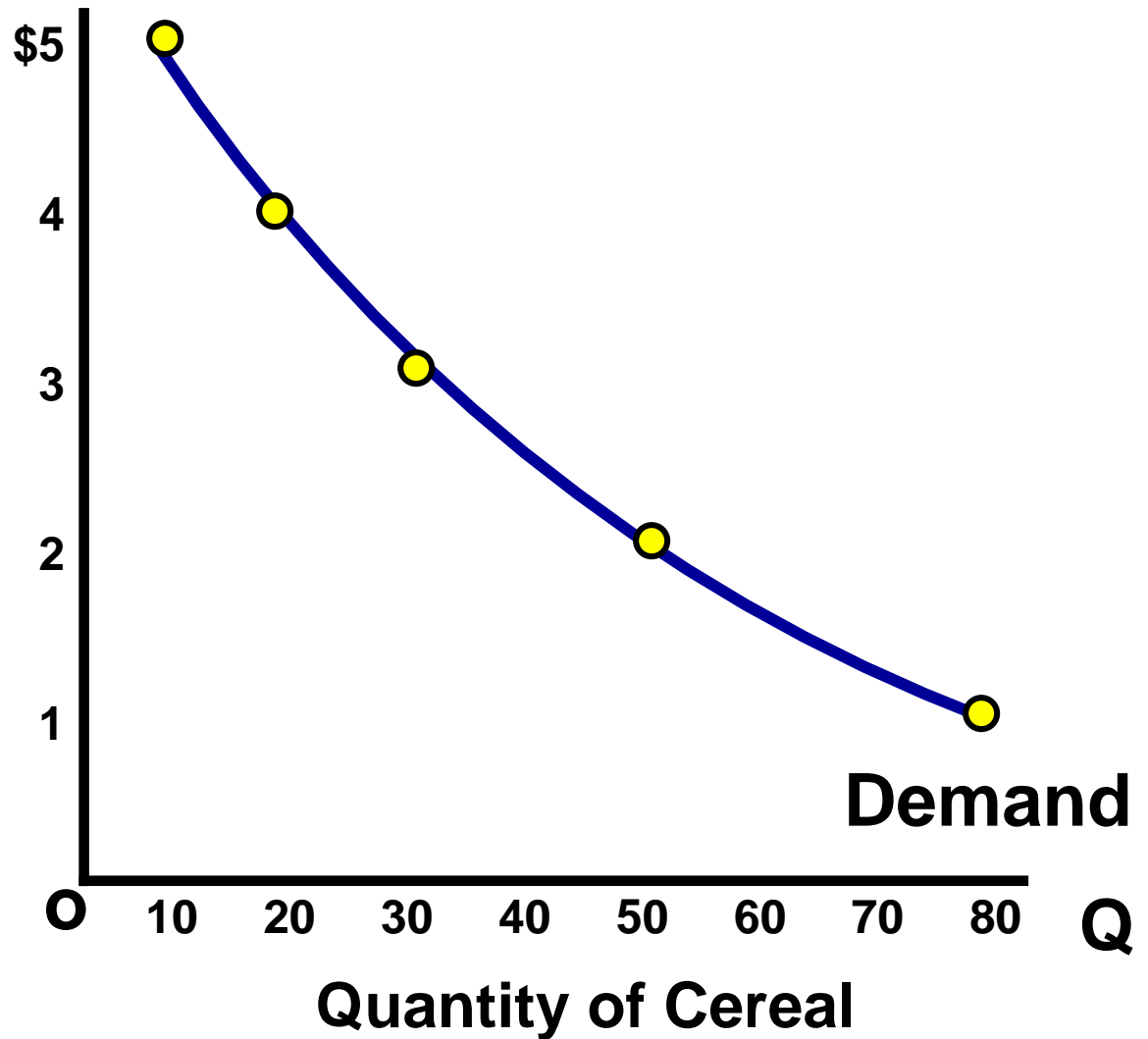
Price	Quantity Demanded
\$5	10
\$4	20
\$3	30
\$2	50
\$1	80



Demand Schedule

Price of Cereal

Price	Quantity Demanded
\$5	10
\$4	20
\$3	30
\$2	50
\$1	80



Keys to Graphing Demand

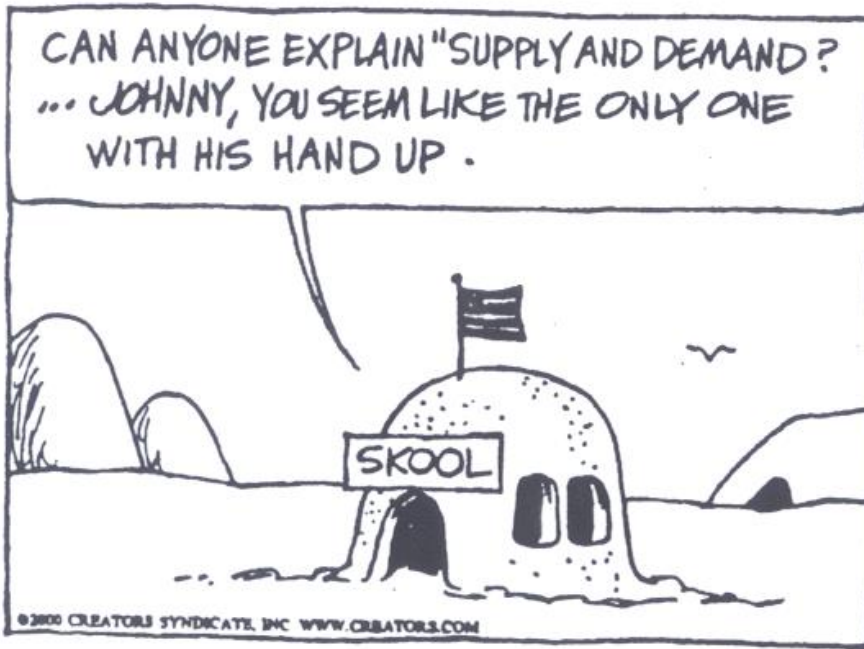
- 1. The slope of the curve is always down and to the right
- 2. A change in demand at the same price requires a **SHIFT** but a change in demand due to a change in price is shown as **MOVEMENT** along the curve

DEMAND vs. QUANTITY DEMANDED

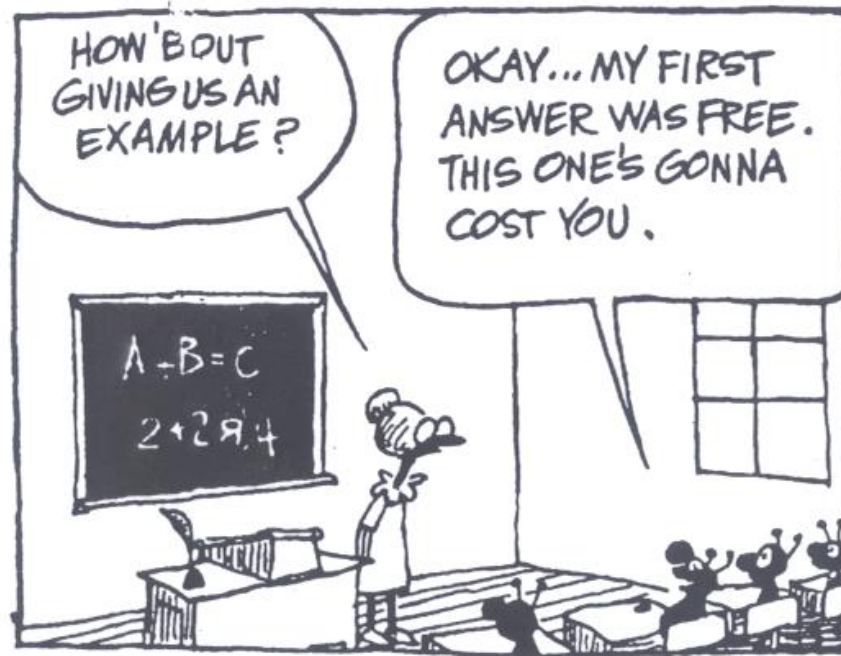
- A change in the ***quantity demanded*** is a movement from one point to another on the demand curve. (DUE TO PRICE)
- A ***change in demand*** itself is a shift of the entire curve (DUE TO A ***M.E.R.I.T.*** FACTOR)

Demand Will **Shift** if there is **M.E.R.I.T**

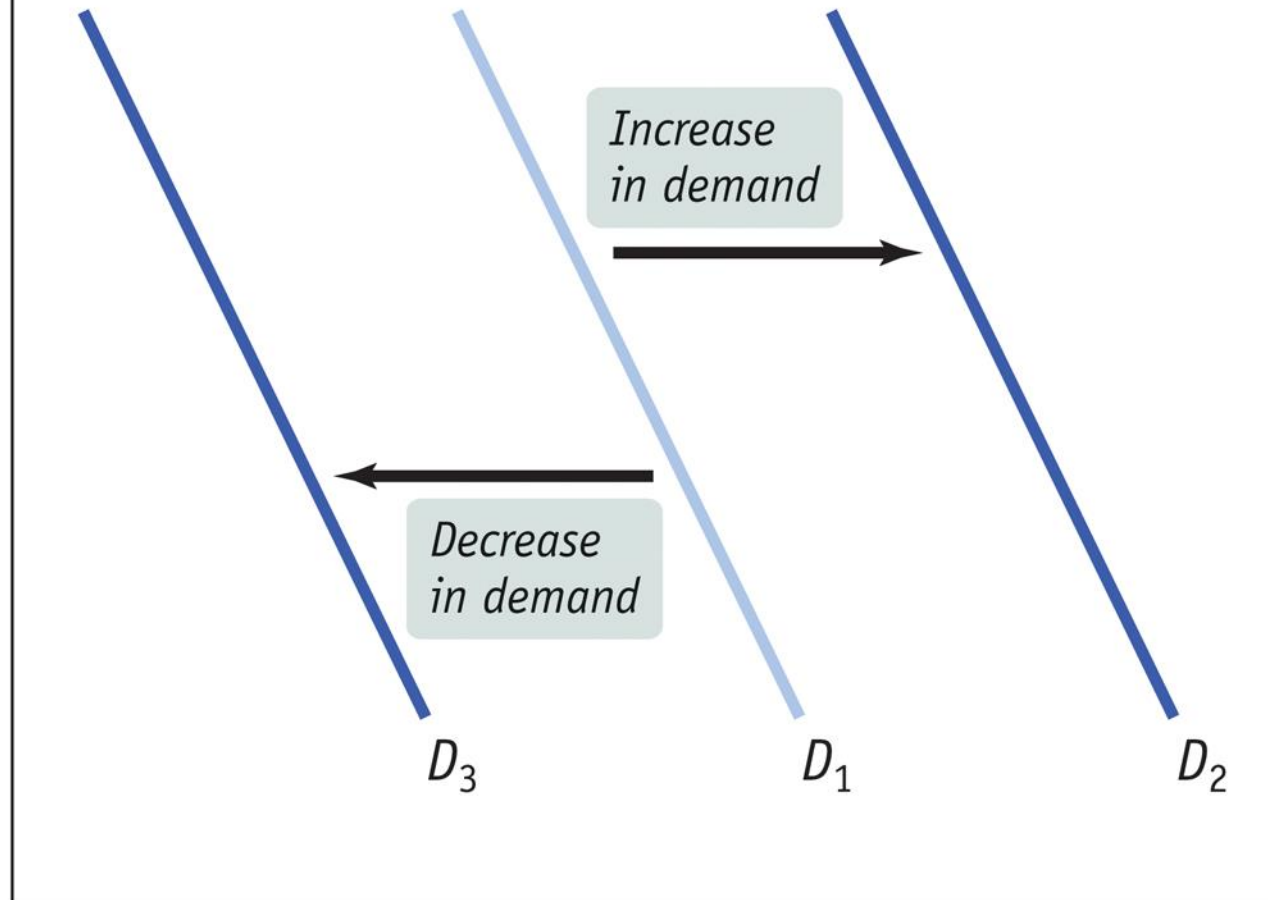
- 1. **M**arket Size
- 2. **E**xpectations
- 3. **R**elated Prices
(compliments/substitutes)
- 4. **I**ncome (normal & inferior)
- 5. **T**astes



WHEN DEMAND IS
HIGH AND SUPPLY
IS LOW...
PRICES GO UP!



Price



Increase
in demand

Decrease
in demand

D_3

D_1

D_2

Quantity

Price of coffee beans (per pound)

\$2.00

1.75

1.50

1.25

1.00

0.75

0.50

0

As price rises, the quantity demanded falls.

Demand curve, *D*

7

9

11

13

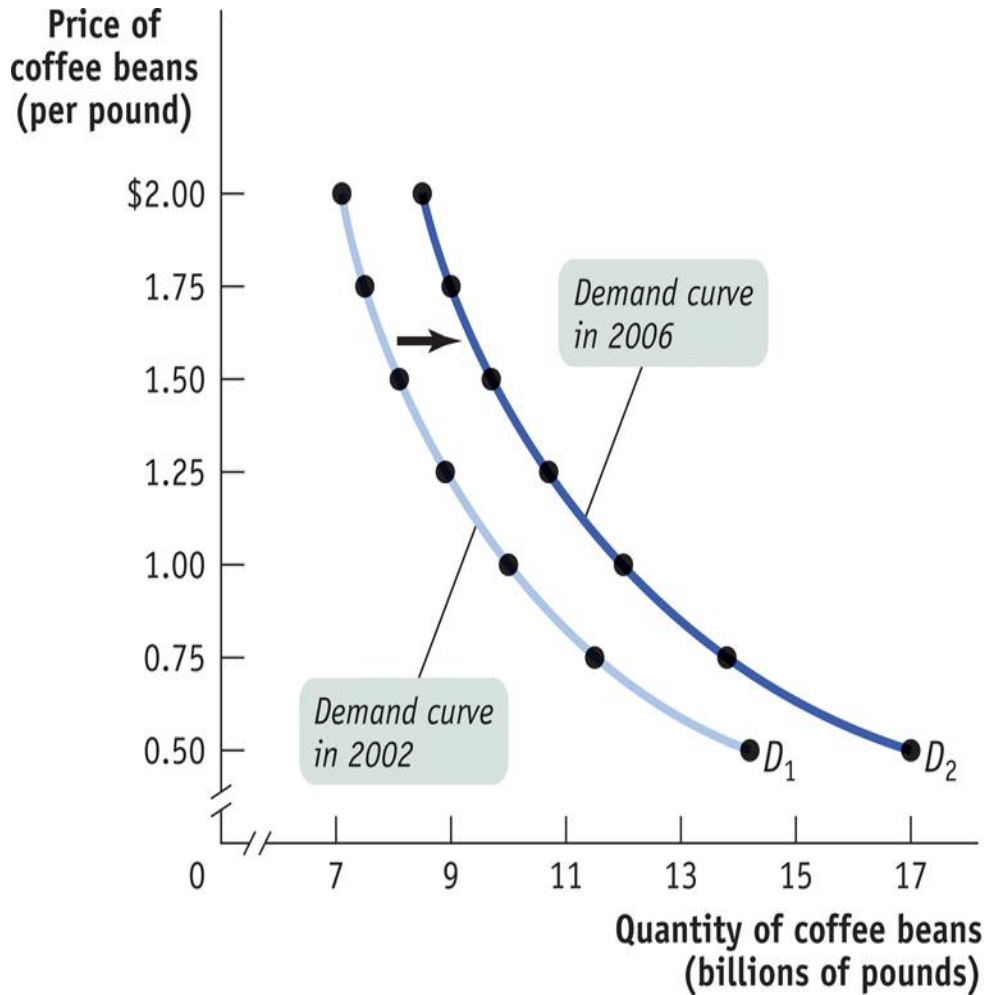
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17

Quantity of coffee beans (billions of pounds)

Demand Schedule for Coffee Beans

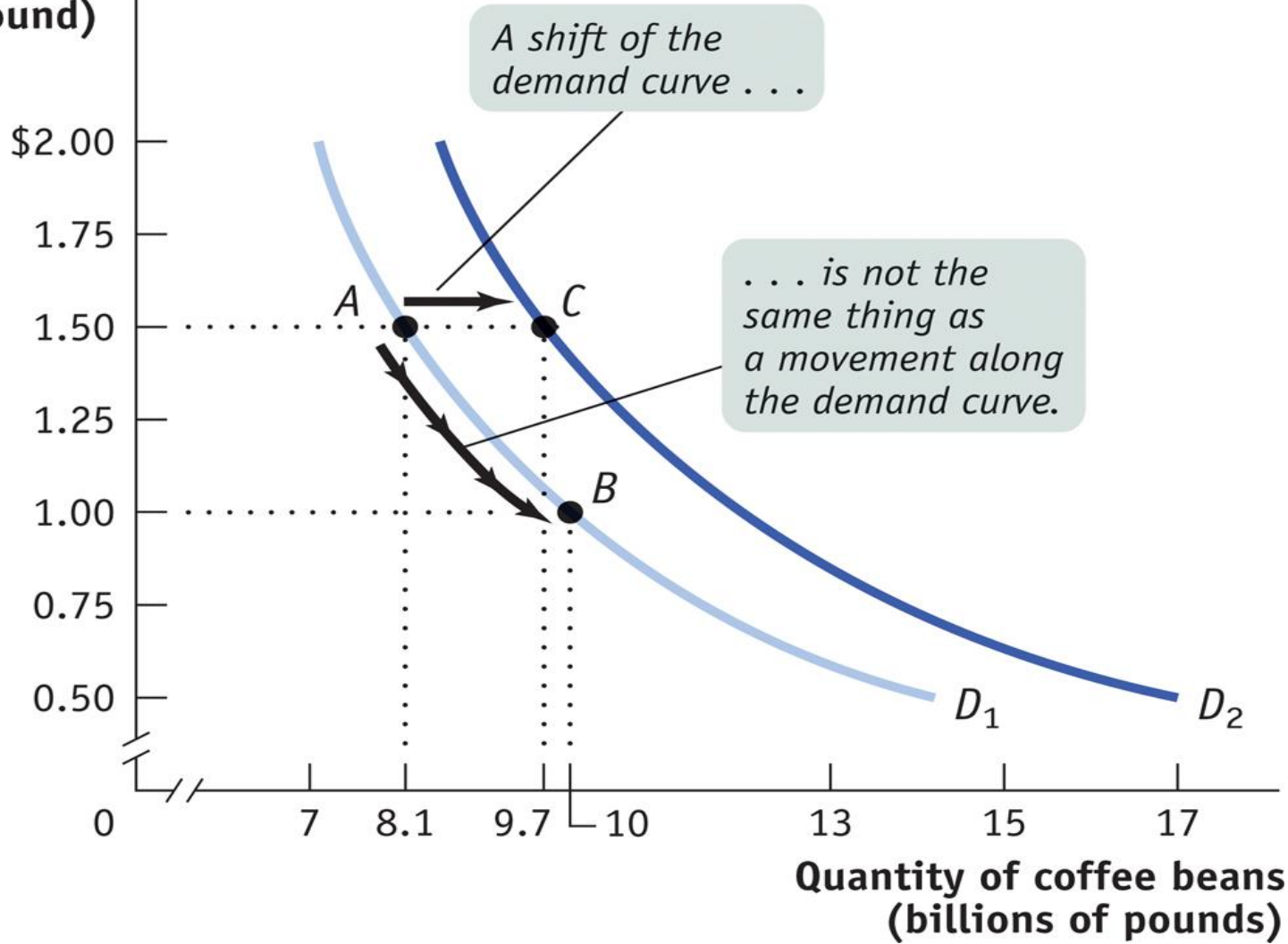
Price of coffee beans (per pound)	Quantity of coffee beans demanded (billions of pounds)
\$2.00	7.1
1.75	7.5
1.50	8.1
1.25	8.9
1.00	10.0
0.75	11.5
0.50	14.2



Demand Schedules for Coffee Beans		
Price of coffee beans (per pound)	Quantity of coffee beans demanded (billions of pounds)	
	in 2002	in 2006
\$2.00	7.1	8.5
1.75	7.5	9.0
1.50	8.1	9.7
1.25	8.9	10.7
1.00	10.0	12.0
0.75	11.5	13.8
0.50	14.2	17.0

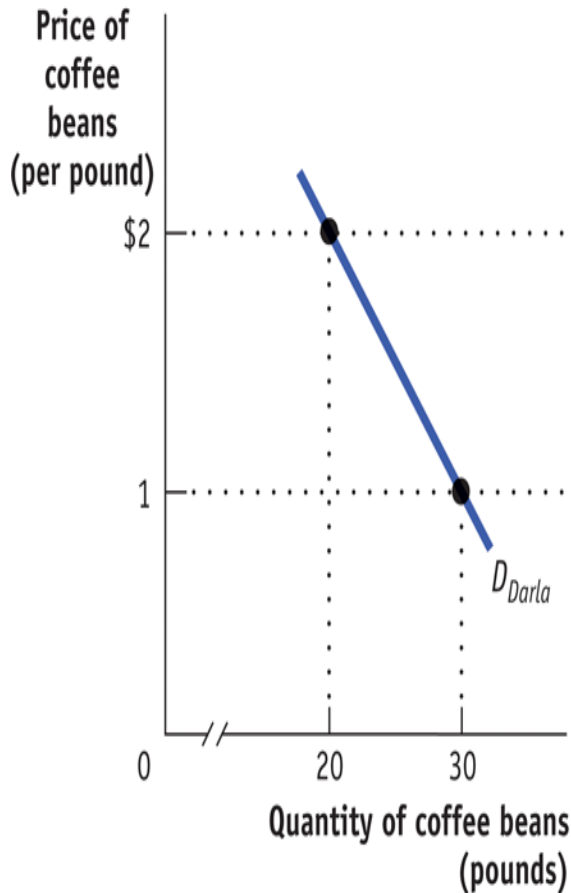
A M.E.R.I.T. FACTOR HAS CAUSED A SHIFT IN THE DEMAND CURVE (NOTE IT IS TO THE RIGHT REFLECTING THE INCREASED DEMAND. A DECREASE IN DEMAND WOULD MEAN A SHIFT TO THE LEFT)

Price of coffee beans (per pound)

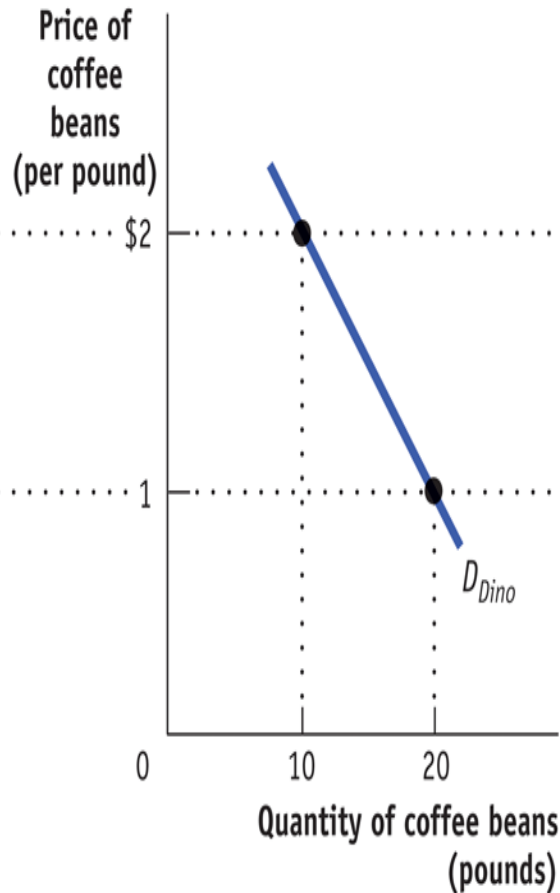


Quantity of coffee beans (billions of pounds)

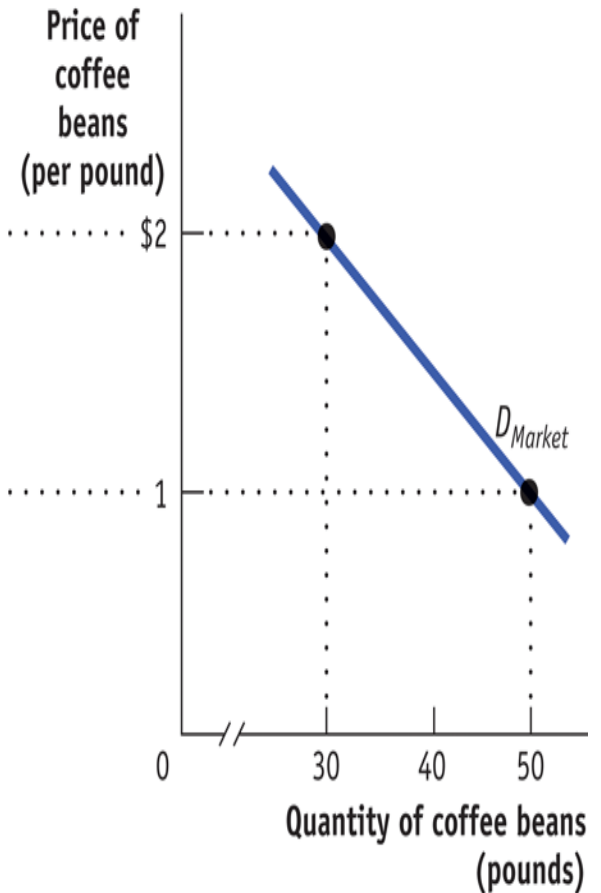
(a) Darla's Individual Demand Curve



(b) Dino's Individual Demand Curve



(c) Market Demand Curve



PAGE 55 OF THE TEXTBOOK TO SEE THE INDIVIDUAL DEMAND CURVE OF (a) and (b) and then note that (c) is the sum of all the individual demand curves of all consumers. In this case Darla and Dino.

How to get the **Market Demand** / add the demand of each consumer at the market equilibrium point of each consumer

Billy

Price	Q Demd
\$5	1
\$4	2
\$3	3
\$2	5
\$1	7

Jean

Price	Q Demd
\$5	0
\$4	1
\$3	2
\$2	3
\$1	5

Other Individuals

Price	Q Demd
\$5	9
\$4	17
\$3	25
\$2	42
\$1	68

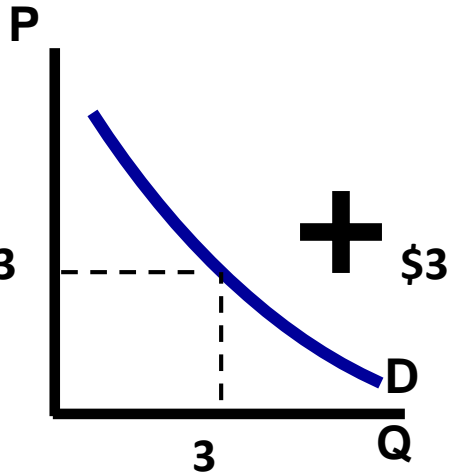
Market

Price	Q Demd
\$5	10
\$4	20
\$3	30
\$2	50
\$1	80

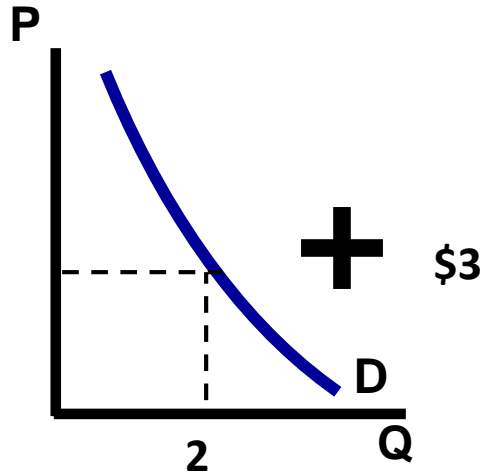
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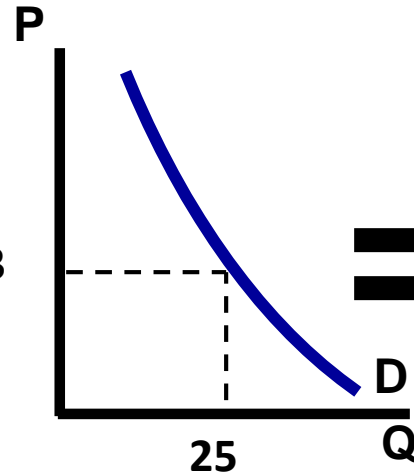
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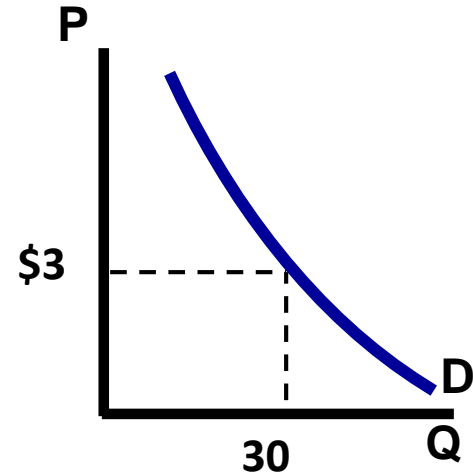
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Key Terms

- **Substitute good** is one whose demand goes up when the price of another good goes up (coffee and tea is an example)
- **Compliment goods** are ones usually used together and thus if demand for one falls then demand for the other will also fall (cars and gasoline are examples of this)
- Most goods are “**normal**” (demand increases as income rises) but some are “**inferior**” (demand drops as income rises...for example buses...as income rises people tend to then take taxis)

Krugman Module 6

Supply

What is supply?

Supply is the different quantities of a good that sellers are **willing** and **able** to sell (produce) at different prices.

What is the Law of Supply?

- As price increases, the quantity producers make increases
- As price falls, the quantity producers make falls.

THIS IS THE OPPOSITE OF DEMAND

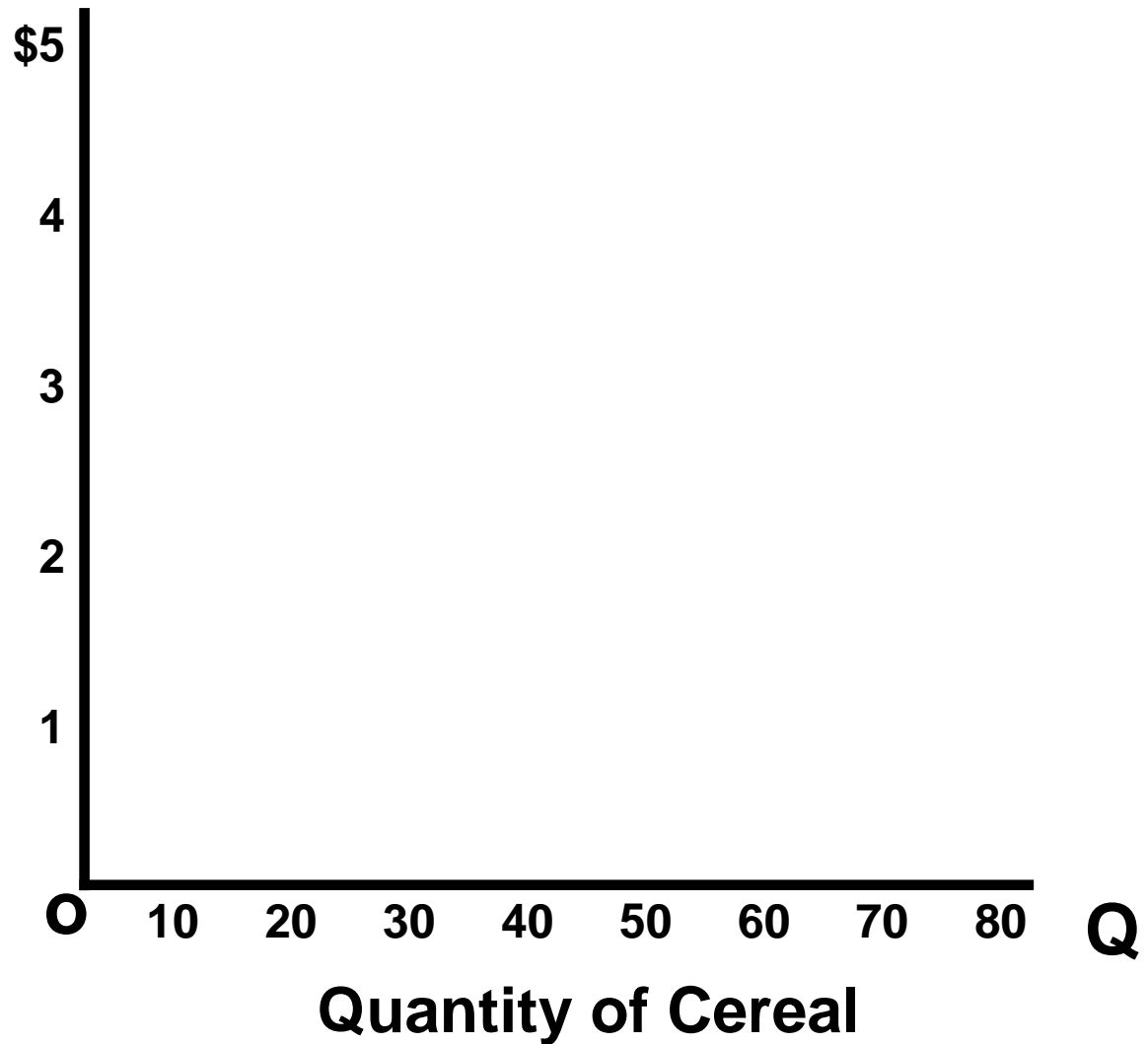
Why? Because, at higher prices profit seeking firms have an incentive to produce more.

GRAPHING SUPPLY EXAMPLE

Supply Schedule

Price of Cereal

Price	Quantity Supplied
\$5	50
\$4	40
\$3	30
\$2	20
\$1	10

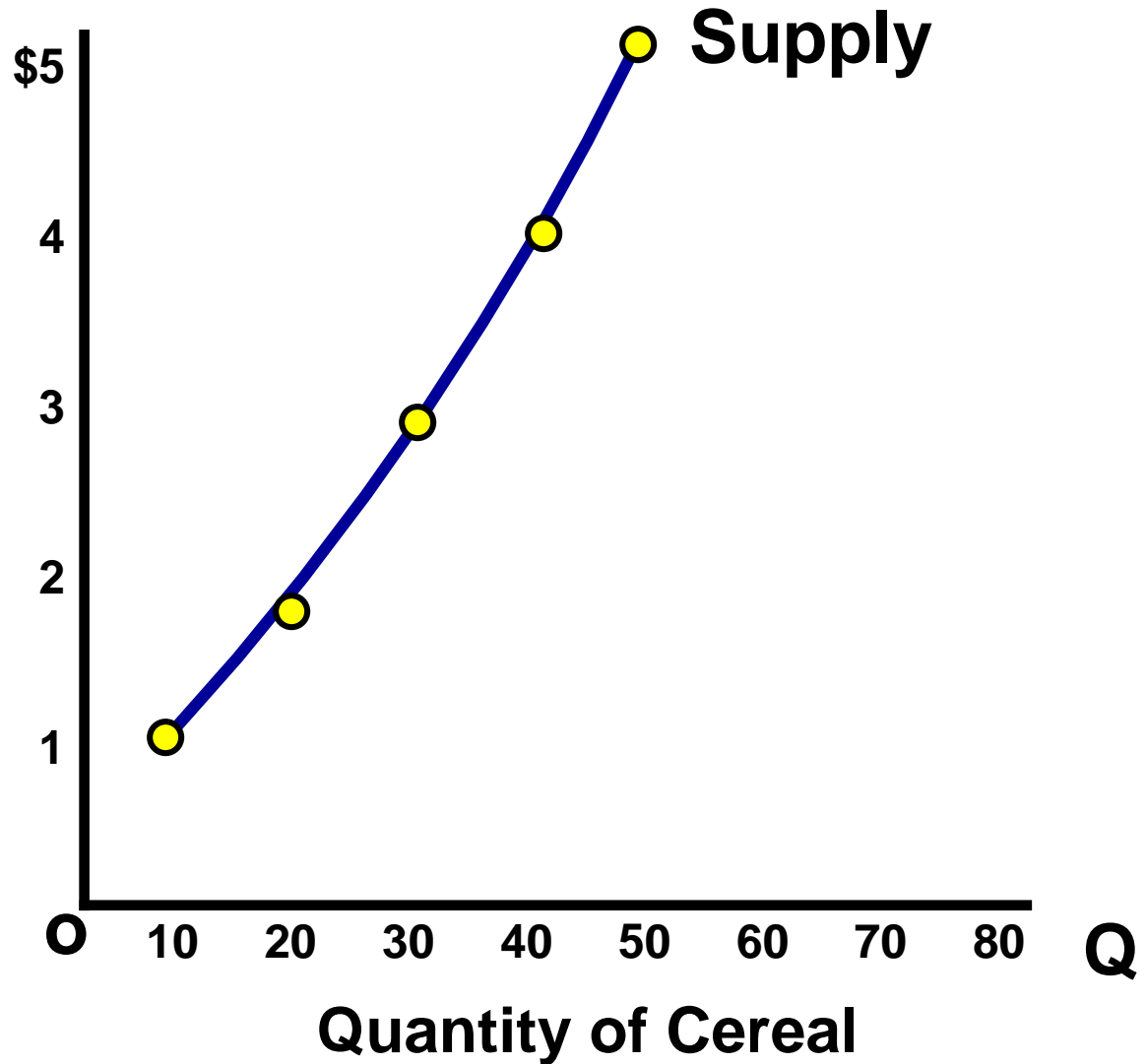


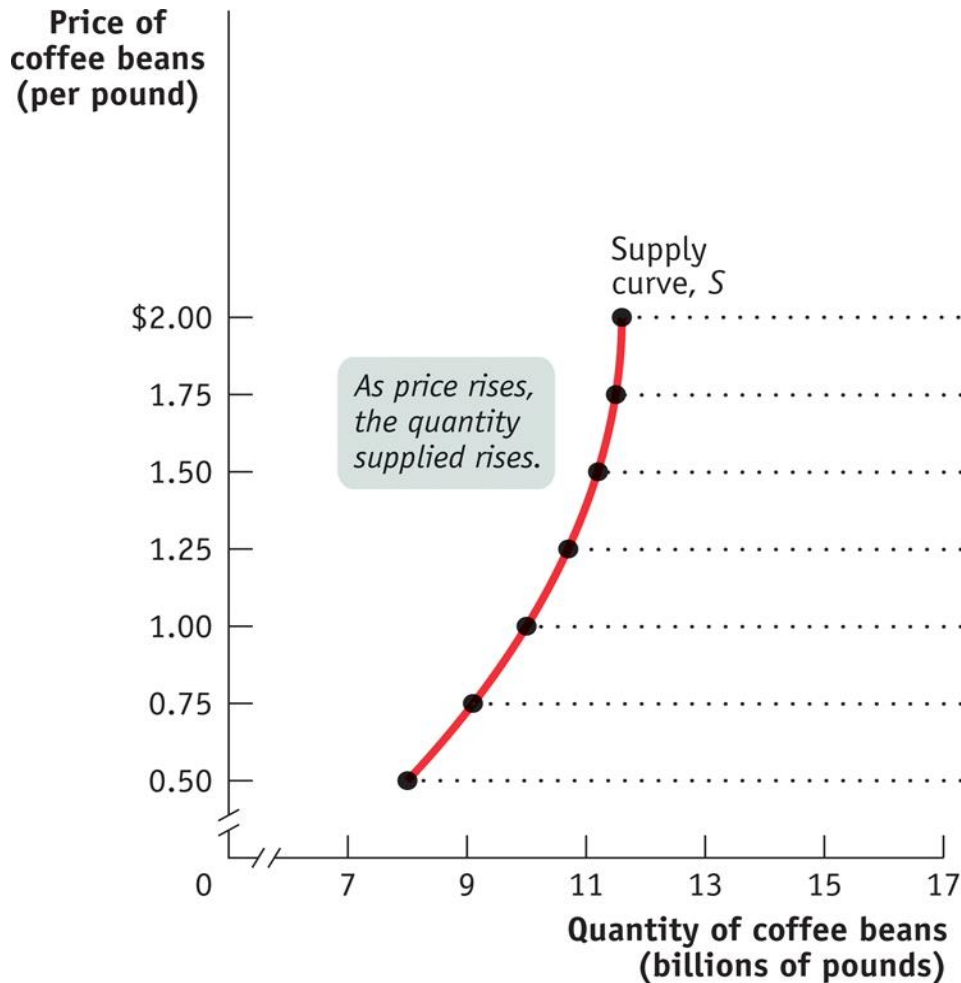
GRAPHING SUPPLY

Supply Schedule

Price of Cereal

Price	Quantity Supplied
\$5	50
\$4	40
\$3	30
\$2	20
\$1	10

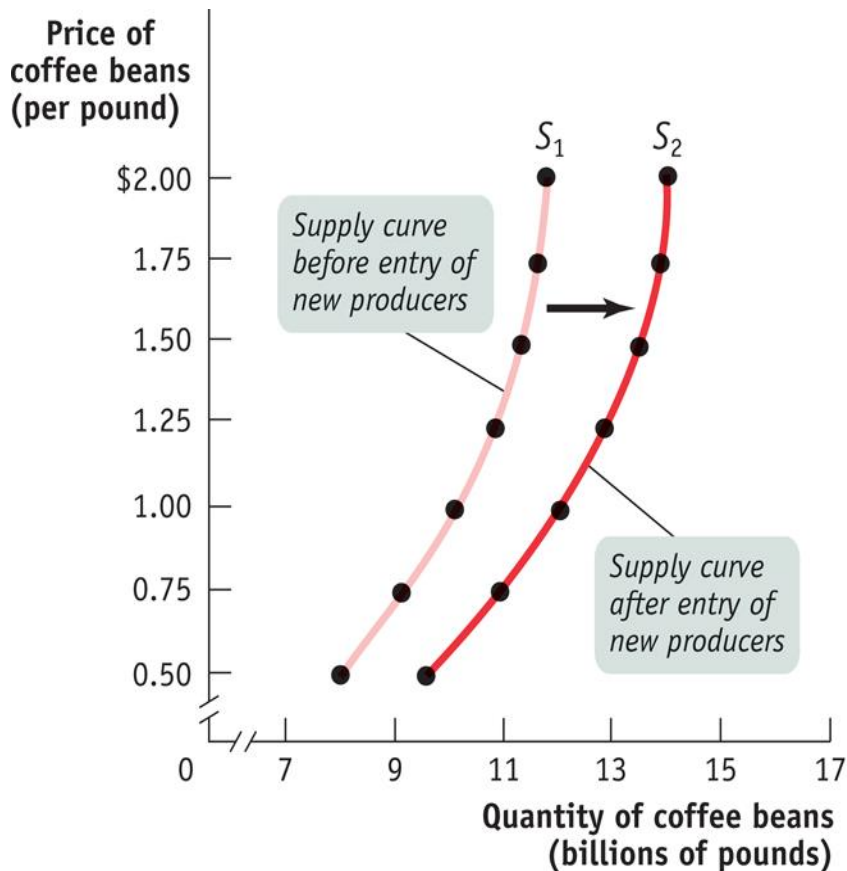




Price of coffee beans (per pound)	Quantity of coffee beans supplied (billions of pounds)
\$2.00	11.6
1.75	11.5
1.50	11.2
1.25	10.7
1.00	10.0
0.75	9.1
0.50	8.0

THIS IS EXAMPLE OF JUST ONE SUPPLIER IN THE MARKET PLACE, BUT WHAT IF ANOTHER SUPPLIER ENTERS THE MARKET PLACE BECAUSE PROFITS LOOK GOOD?

- As with demand, market supply is arrived at by horizontally adding up the individual supplies of all of the firms in the market.



Supply Schedules for Coffee Beans		
Price of coffee beans (per pound)	Quantity of coffee beans supplied (billions of pounds)	
	Before entry	After entry
\$2.00	11.6	13.9
1.75	11.5	13.8
1.50	11.2	13.4
1.25	10.7	12.8
1.00	10.0	12.0
0.75	9.1	10.9
0.50	8.0	9.6

- It is important to distinguish between a change in supply (meaning a **SHIFT**) of the supply curve and **MOVEMENT** along the supply curve.
- **SHIFT** is caused by one of five factors or determinants other than price.
- **MOVEMENT** is caused merely by the change in price.

There are 5 Determinants (SHIFTERS) of Supply

1. Change in Expectations of Future Profits
2. Change in number of Sellers (Producers)
3. Change in Technology
4. Change in price of Related Goods or Services
5. Prices/Availability of Inputs (resources)

REFER TO THESE AS T.I.R.E.S.

- Although not made part of T.I.R.E.S. there is one additional factor that can SHIFT the Supply Curve and that is:

When the government increases/decreases **taxes** or decides to **subsidize** a good or service.

GRAPHING SUPPLY

**Supply
Schedule**

Price of Cereal

Supply

Price	Quantity
\$5	
\$4	
\$3	
\$2	
\$1	10

For Example: What if new
companies start making
Cereal Because they see the Profit Potential?
(new producer)

0 10 20 30 40 50 60 70 80 Q

Quantity of Cereal

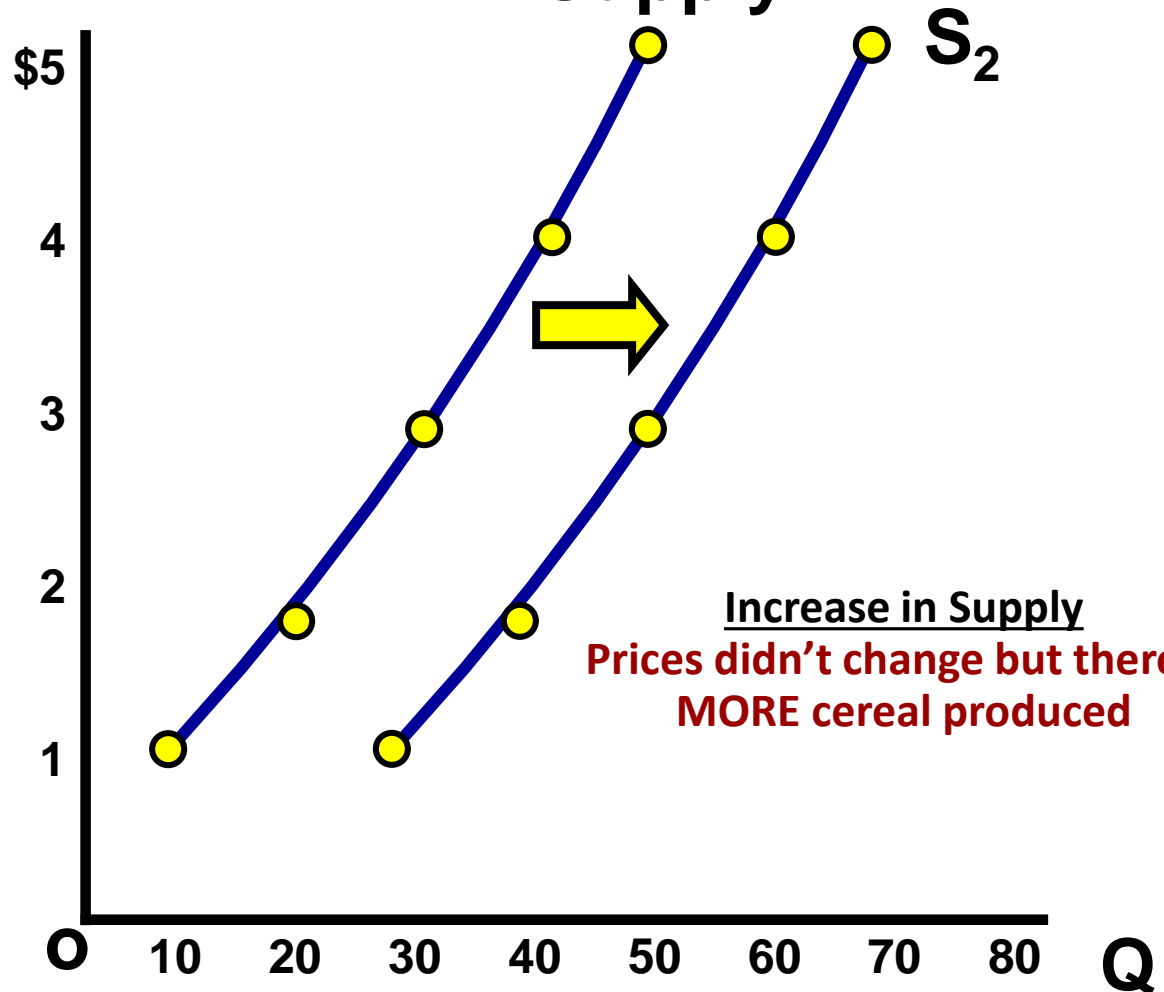
Change in Supply

Supply Schedule

Price	Quantity Supplied
\$5	50 70
\$4	40 60
\$3	30 50
\$2	20 40
\$1	10 30

Price of Cereal

Supply



Quantity of Cereal

Change in Supply

**Supply
Schedule**

Price of Cereal

Supply

Price	Quantity
\$5	
\$4	
\$3	
\$2	
\$1	10

**Or, What if a Drought
Comes and Destroys the Corn and Wheat
Crops used to make cereal?
(increased cost of inputs)**



Quantity of Cereal

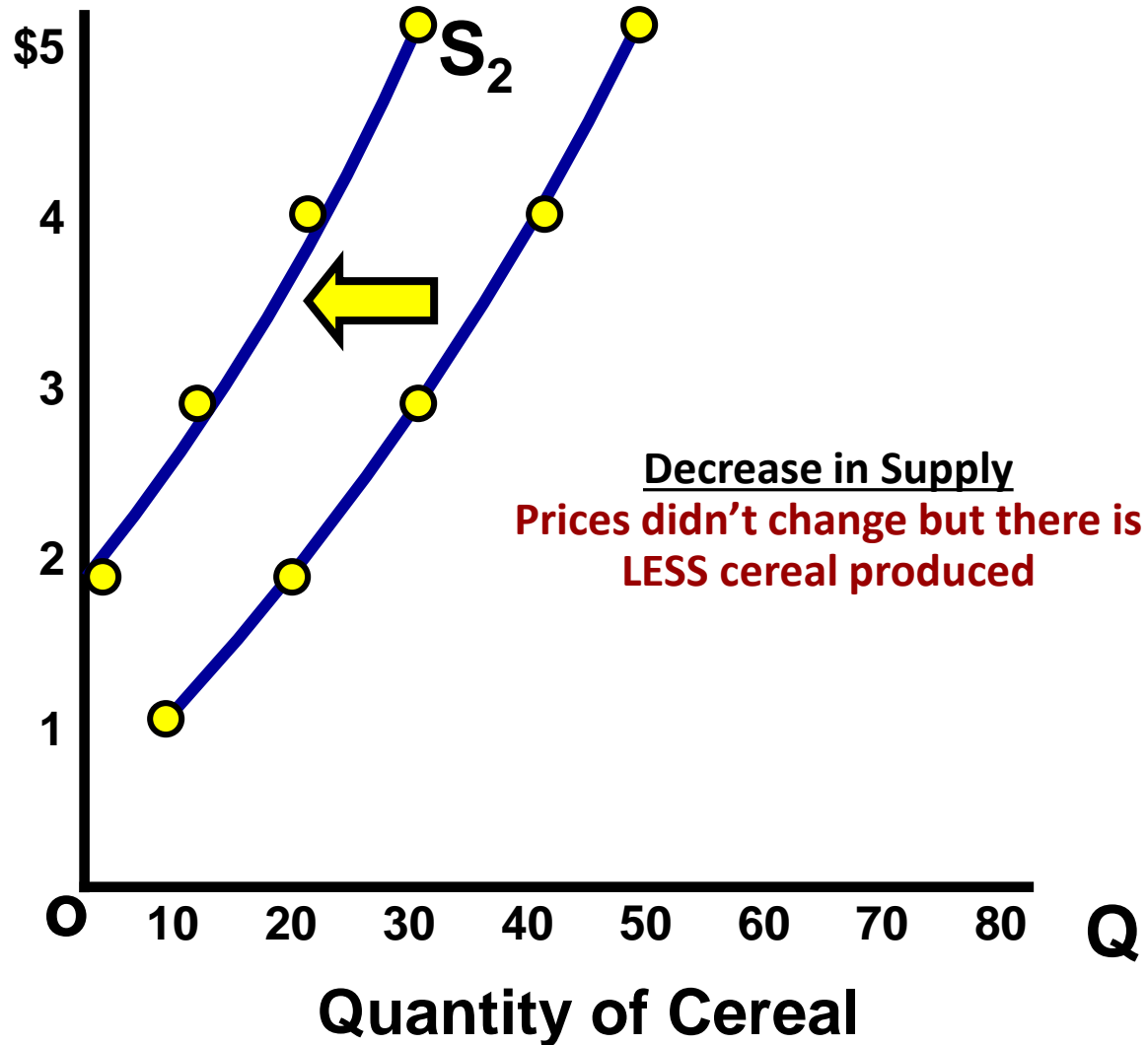
Change in Supply

Supply Schedule

Price	Quantity Supplied
\$5	50 30
\$4	40 20
\$3	30 10
\$2	20 1
\$1	10 0

Price of Cereal

Supply



Lets Try Some Examples

1. Which determinant (SHIFTER)?
2. Increase or decrease of Supply?
3. Which direction will curve shift?

Sale of Hamburger Meat by Producer Company

1. Mad cow disease kills 20% of cows
 2. Price of burgers increase 30%
 3. Restaurants sell both burgers and tacos.
Demand increases for tacos 500%
 4. New technology cuts production time in half
1. Minimum wage increases to \$10
 2. Government increases tax on hamburgers

Supply Practice

**First, identify the determinant (shifter) then
decide if supply will increase or decrease**

	Shifter	Increase or Decrease	Left or Right
1			
2			
3			
4			
5			
6			

Supply Practice

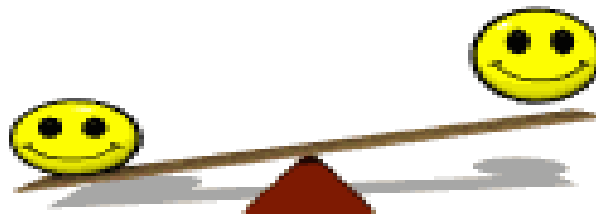
First, identify the determinant (shifter) then decide if supply will increase or decrease

	Shifter	Increase or Decrease	Left or Right
1	Input	Decrease	Left
2	None		
3	Related Good	Decrease	Left
4	Technology	Increase	Right
5	Subsidy	Increase	Right
6	Tax	Decrease	Left

Putting Supply and Demand Together

Krugman's Module 7

Demand / Supply

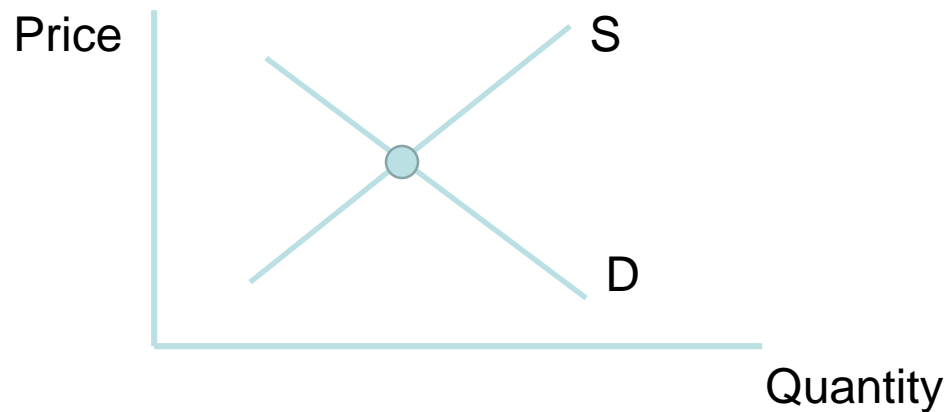


Market Equilibrium

- A market will determine the price at which the quantity of a product demanded is equal to the quantity supplied.
- At this price, the market will be in **equilibrium**, meaning that the amount consumers wish to purchase at this price is matched exactly by the amount producers wish to sell.

TO DETERMINE EQUILIBRIUM NEED TO GRAPH SUPPLY AND DEMAND TOGETHER

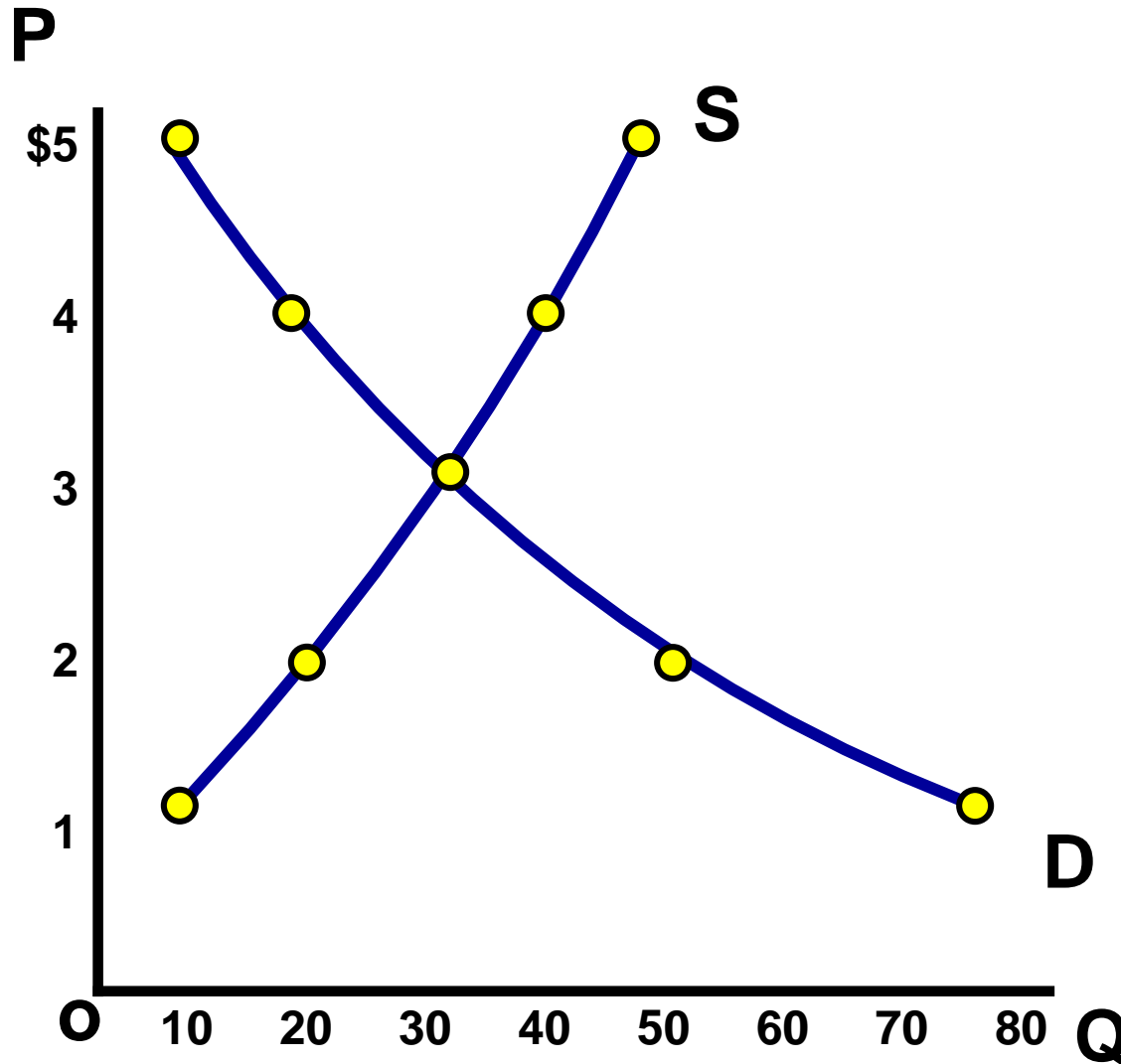
- Equilibrium occurs when quantity supplied exactly equals quantity demanded.



S&D together = E so What is E point on graph below?

**Demand
Schedule**

P	Q _d
\$5	10
\$4	20
\$3	30
\$2	50
\$1	80

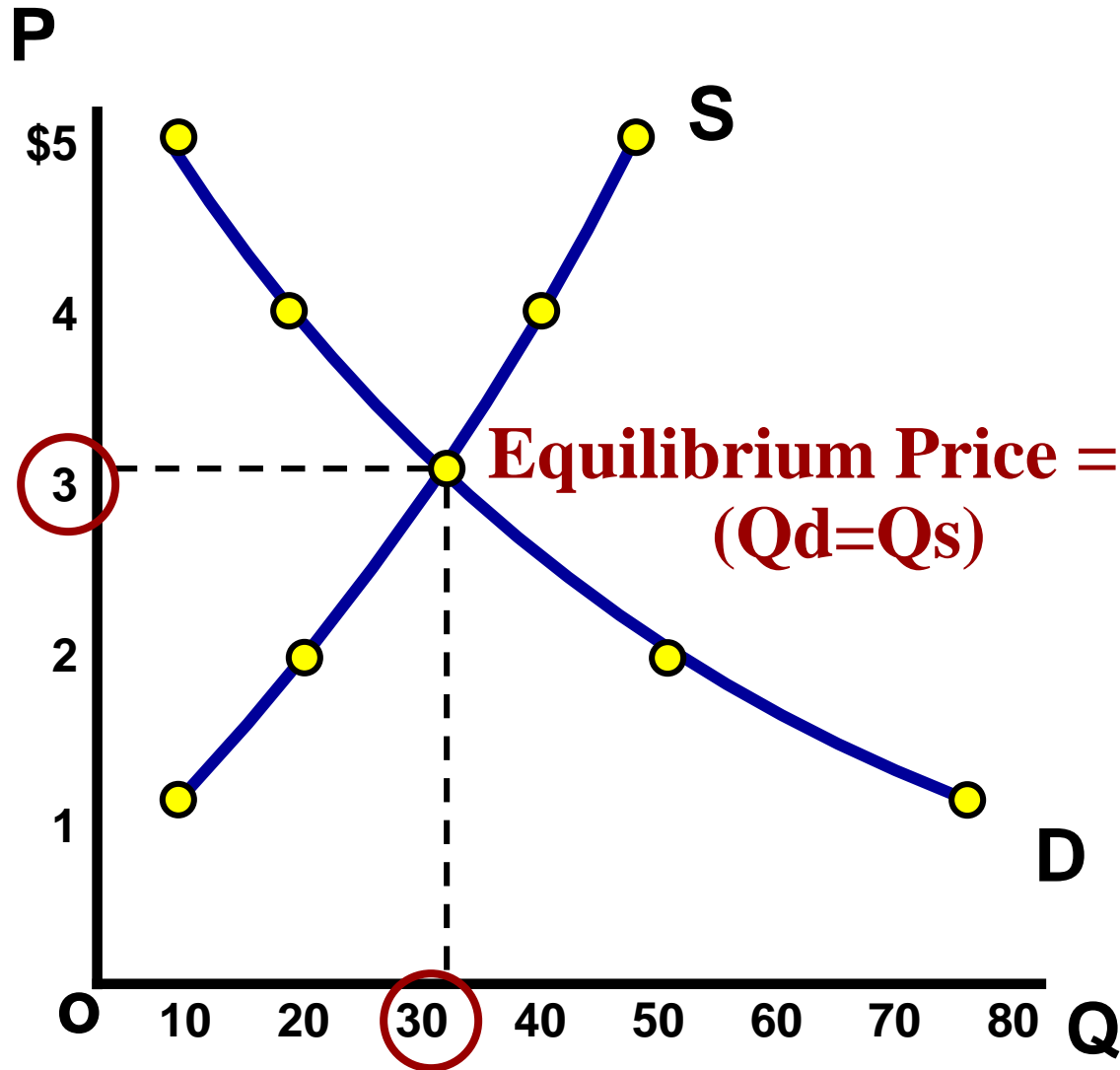


**Supply
Schedule**

P	Q _s
\$5	50
\$4	40
\$3	30
\$2	20
\$1	10

Demand Schedule

P	Q _d
\$5	10
\$4	20
\$3	30
\$2	50
\$1	80



Supply Schedule

P	Q _s
\$5	50
\$4	40
\$3	30
\$2	20
\$1	10

Equilibrium Quantity is 30

Demand Schedule

P	Q _d
\$5	10
\$4	20
\$3	30
\$2	50
\$1	80

P

\$5



What if the price increases to \$4?

O

10

20

30

40

50

60

70

80

Q

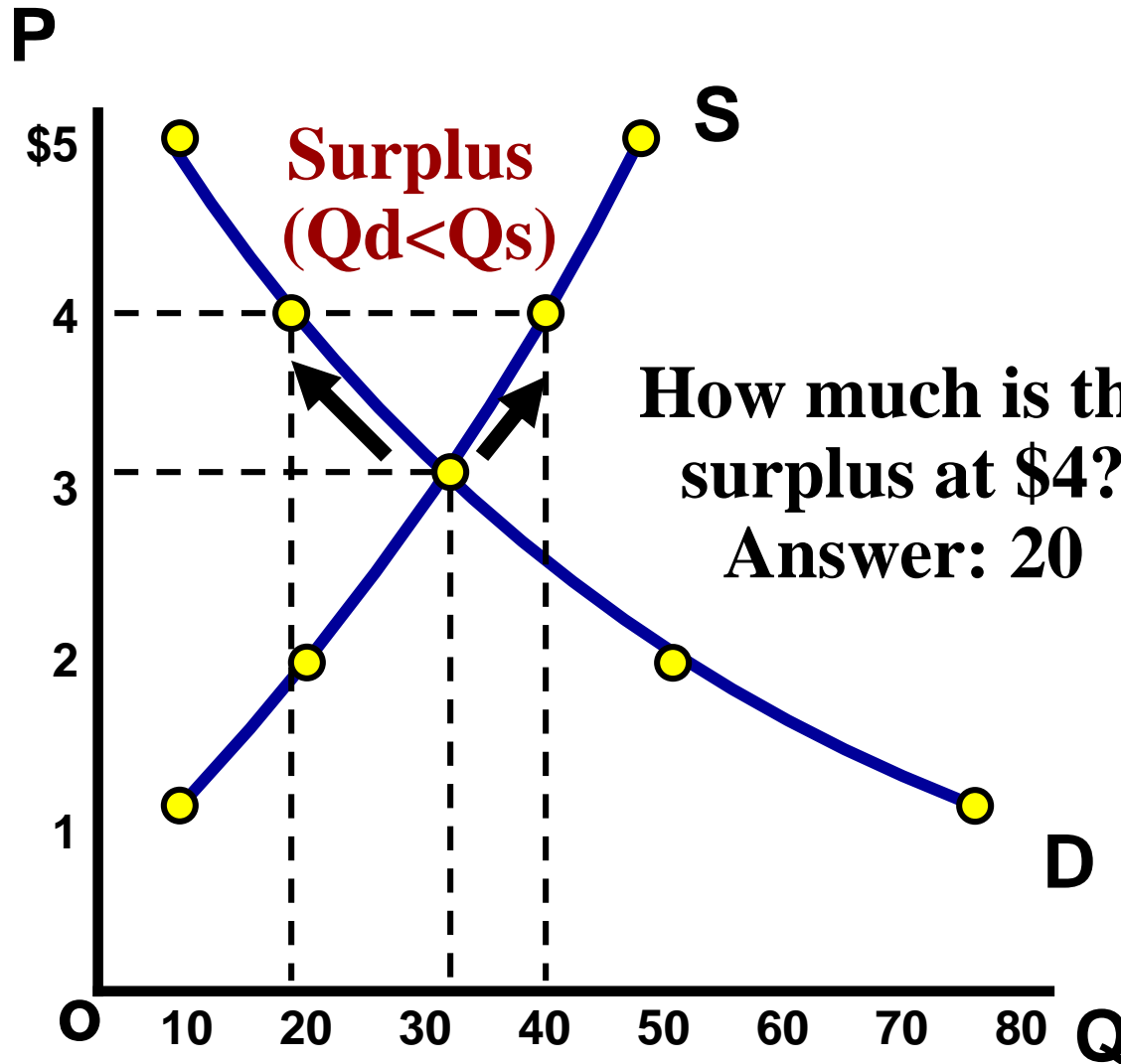
Supply Schedule

P	Q _s
\$5	50
\$4	40
\$3	30
\$2	20
\$1	10

At \$4, there is disequilibrium. The quantity demanded is less than quantity supplied.

Demand Schedule

P	Qd
\$5	10
\$4	20
\$3	30
\$2	50
\$1	80



Supply Schedule

P	Qs
\$5	50
\$4	40
\$3	30
\$2	20
\$1	10

Demand Schedule

P	Q _d
\$5	10
\$4	20
\$3	30
\$2	50
\$1	80

P

\$5

O

10

20

30

40

50

60

70

80

Q

Supply Schedule

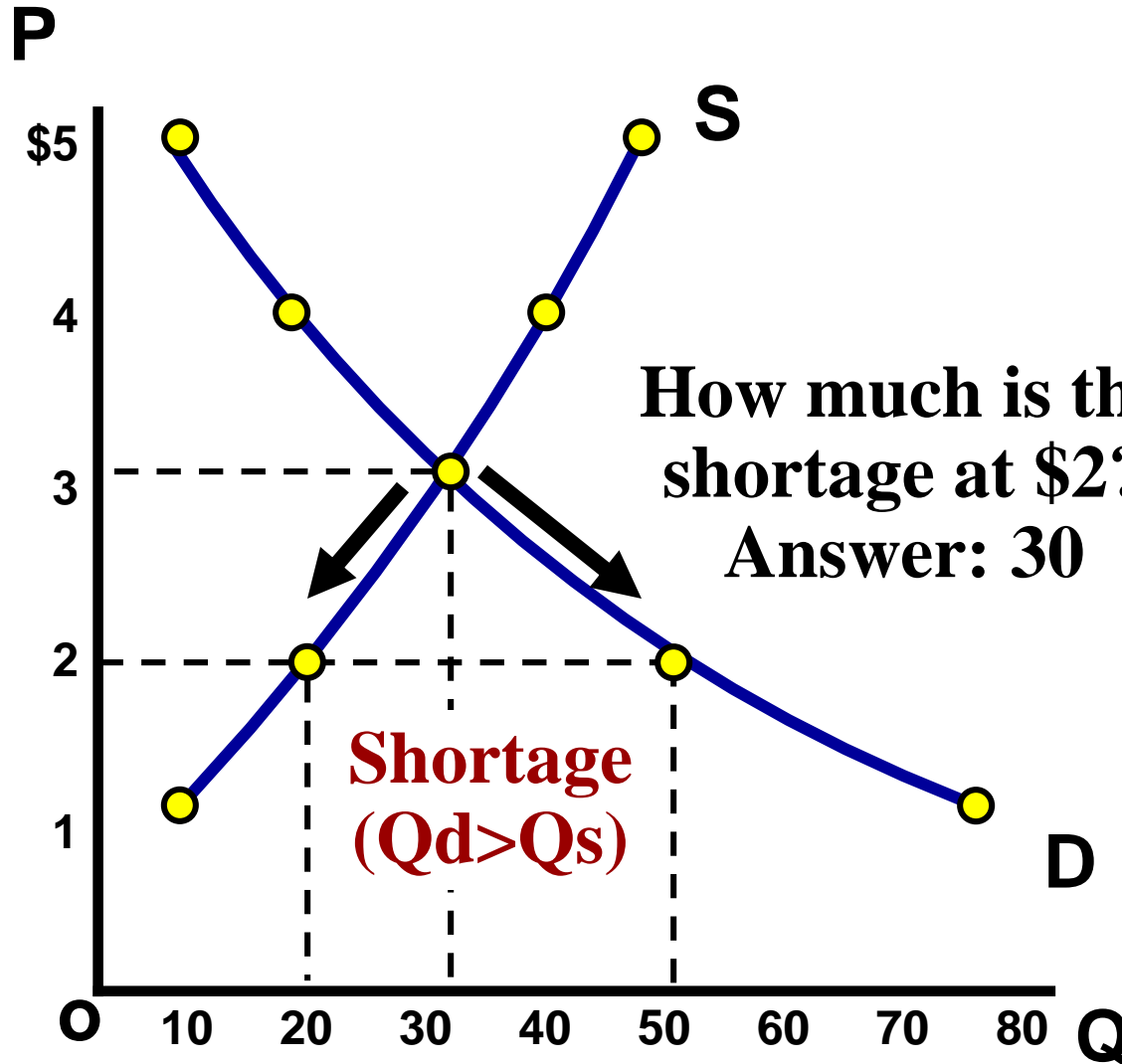
P	Q _s
\$5	50
\$4	40
\$3	30
\$2	20
\$1	10

What if the price decreases to \$2?

At \$2, there is disequilibrium. The quantity demanded is greater than quantity supplied.

Demand Schedule

P	Q _d
\$5	10
\$4	20
\$3	30
\$2	50
\$1	80



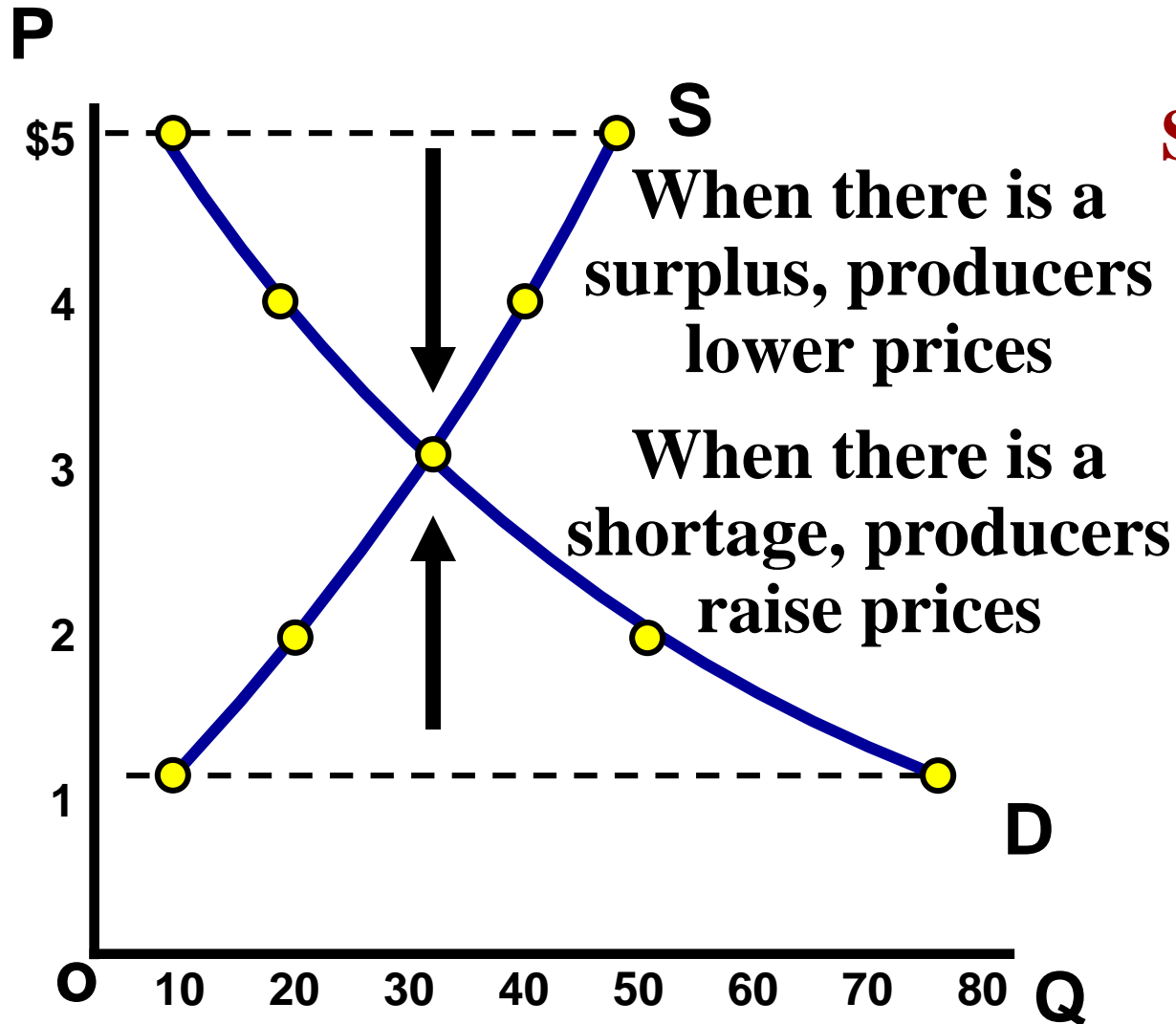
Supply Schedule

P	Q _s
\$5	50
\$4	40
\$3	30
\$2	20
\$1	10

The FREE MARKET system automatically pushes the price toward equilibrium.

Demand Schedule

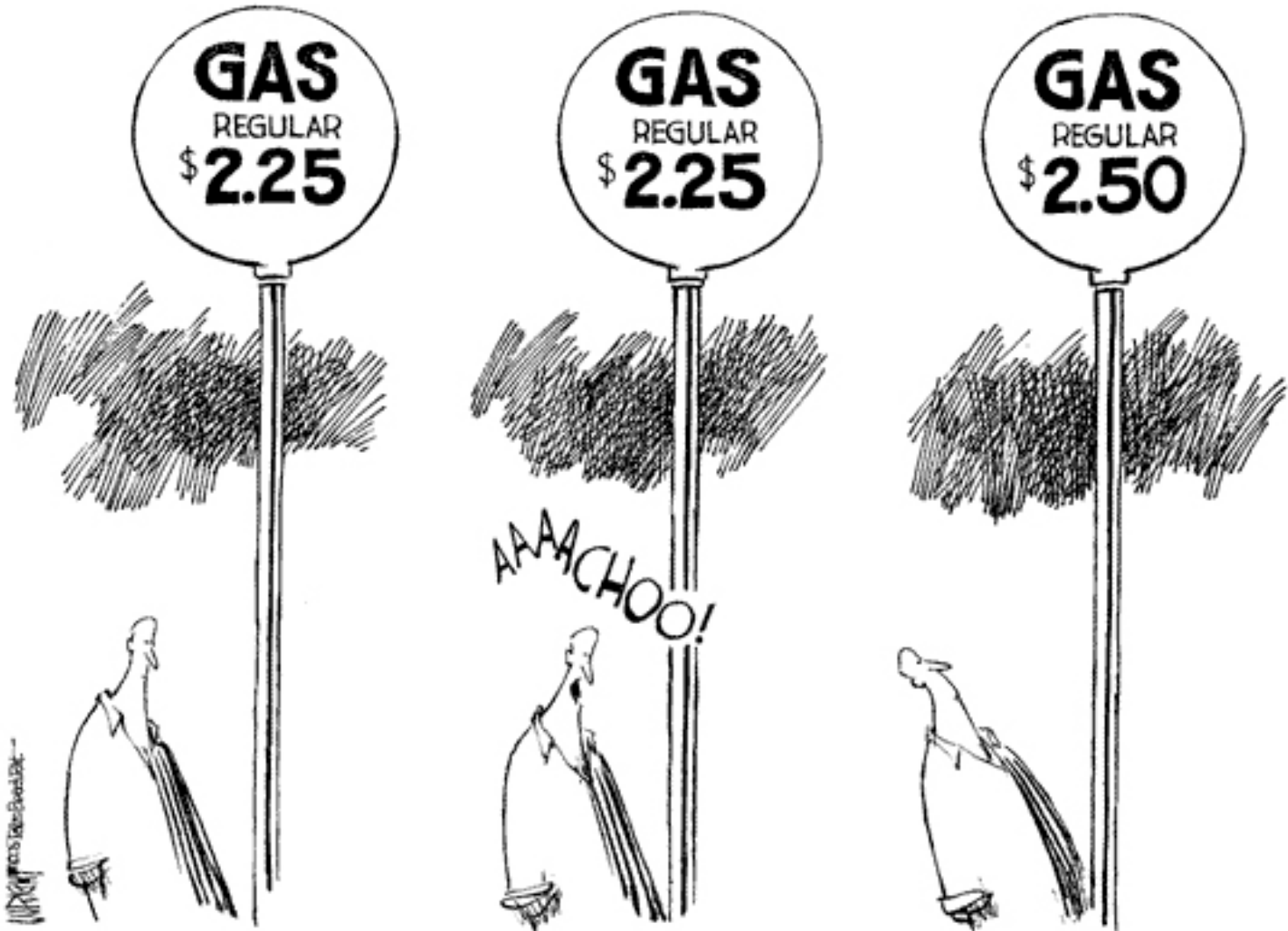
P	Q _d
\$5	10
\$4	20
\$3	30
\$2	50
\$1	80



Supply Schedule

P	Q _s
\$5	50
\$4	40
\$3	30
\$2	20
\$1	10

Always Assume shifts in supply or demand change equilibrium P and Q **instantaneously**



Learning to Diagram the Change is Easy as 1, 2, 3

1. Before the change:

- Draw supply and demand
- Label original equilibrium price and quantity

2. The change:

- Did it affect supply or demand first?
- Which determinant caused the shift?
- Draw increase or decrease

3. After change:

- Label new equilibrium?
- What happens to Price? (increase or decrease)
- What happens to Quantity? (increase or decrease)

Demand Will **Shift** if there is **M.E.R.I.T**

- 1. Market Size
- 2. Expectations
- 3. Related Prices (compliments/substitutes)
- 4. Income (normal & inferior)
- 5. Tastes

SUPPLY WILL SHIFT IF THERE IS **T.I.R.E.S.**

1. Change in Technology
2. Change in Inputs
3. Change in Related Goods or Services
4. Change in Expectations of Future Profits
5. Change in # of Sellers (Producers) in the Market

- 1. Before Change (Draw equilibrium)**
- 2. The Change (S or D, Identify Shifter)**
- 3. After Change (Price and Quantity After)**

Analyze Sale of Hamburgers Again

WHAT IS THE RESULT FROM CHANGES BELOW

- 1. Price of sushi (a substitute) increases**
- 2. New technology cuts production time
1/2**
- 3. Price of burgers falls from \$3 to \$1.**
- 4. Price for ground beef triples**
- 5. Fingers found in multiple burger
restaurants.**

1. Price of sushi (a substitute) increases D increases

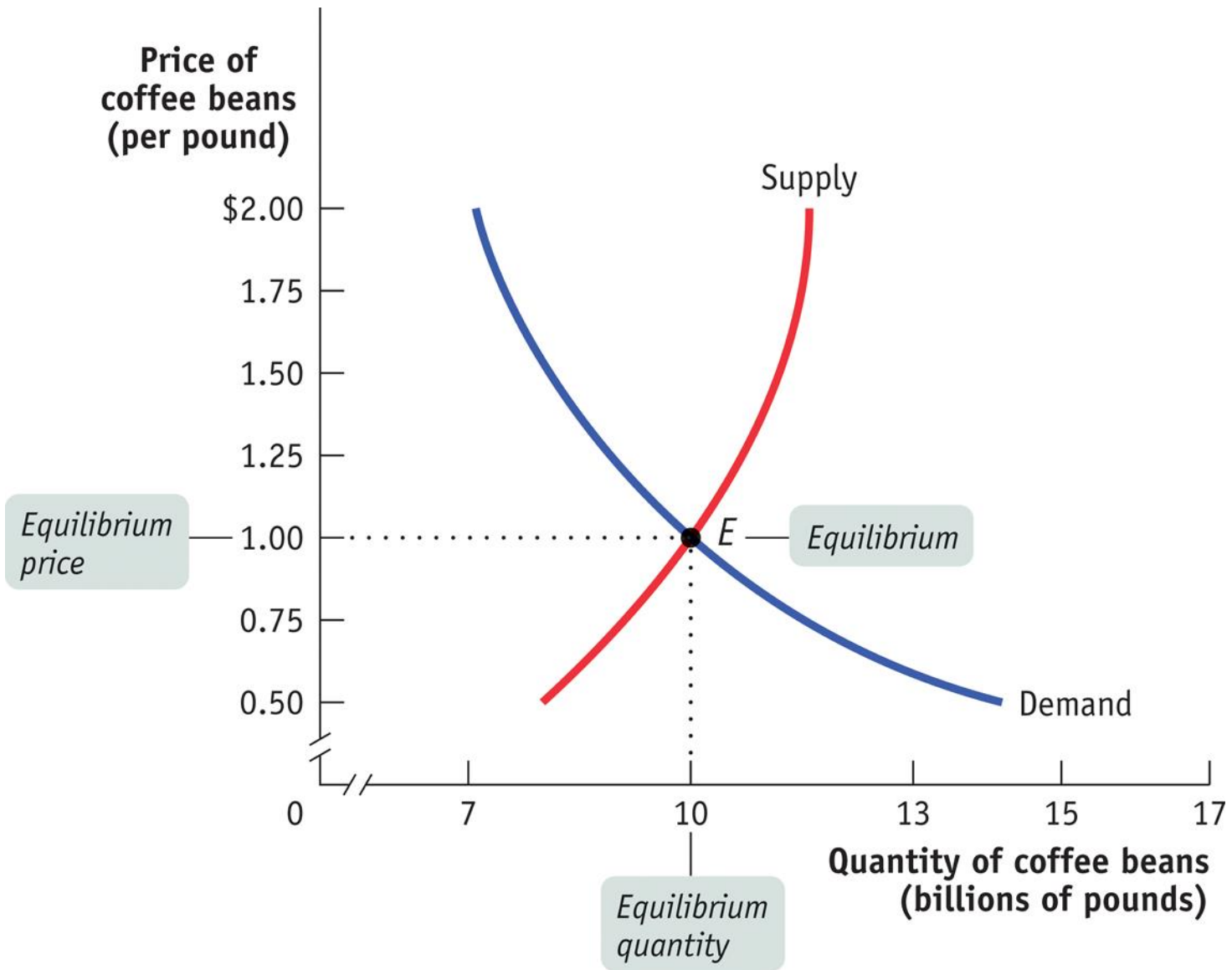
2. New technology cuts production time $\frac{1}{2}$ S increases

3. Price of burgers falls from \$3 to \$1. no shift

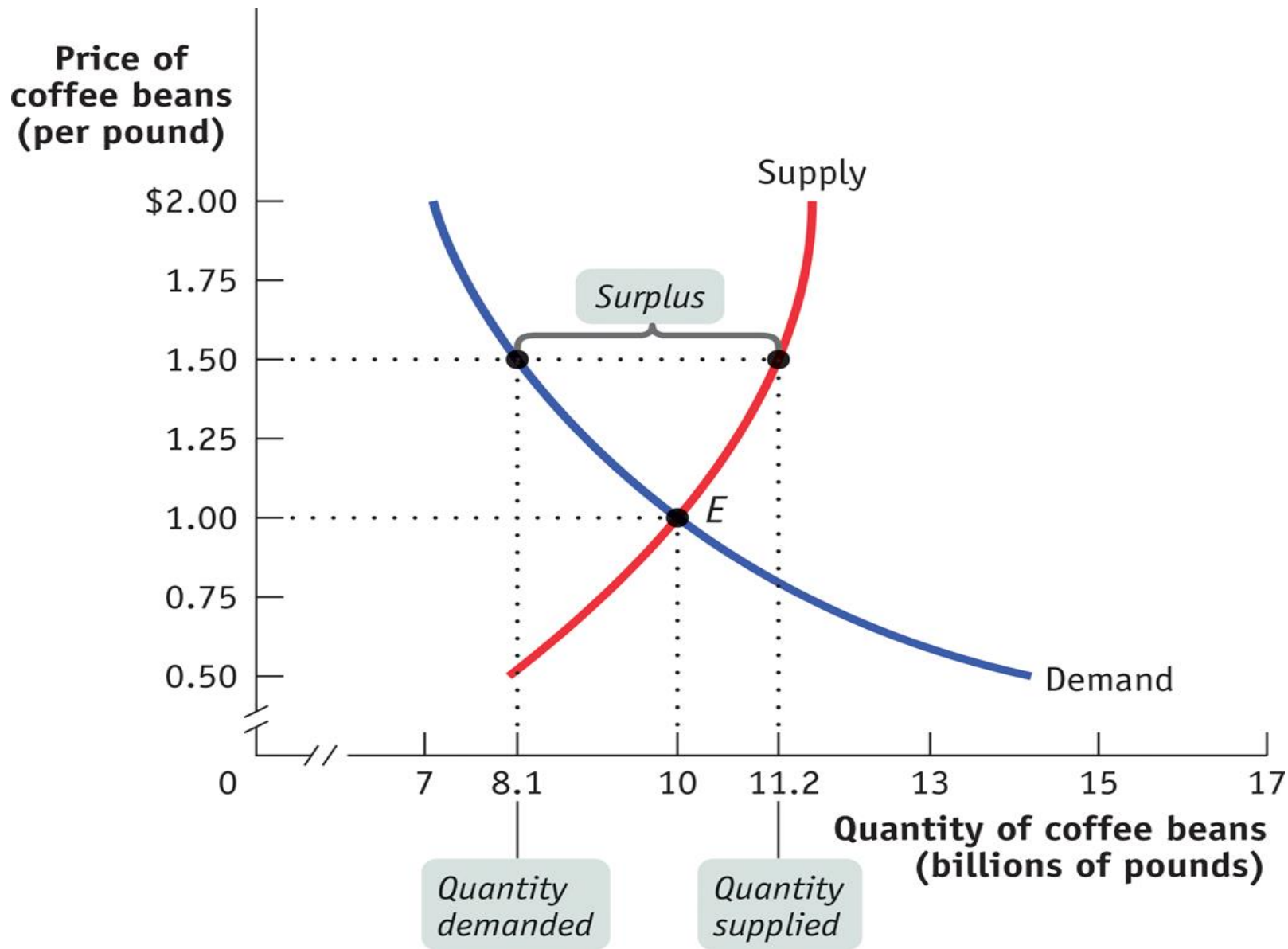
4. Price for ground beef triples S decreases

5. Fingers found in multiple burger restaurants.

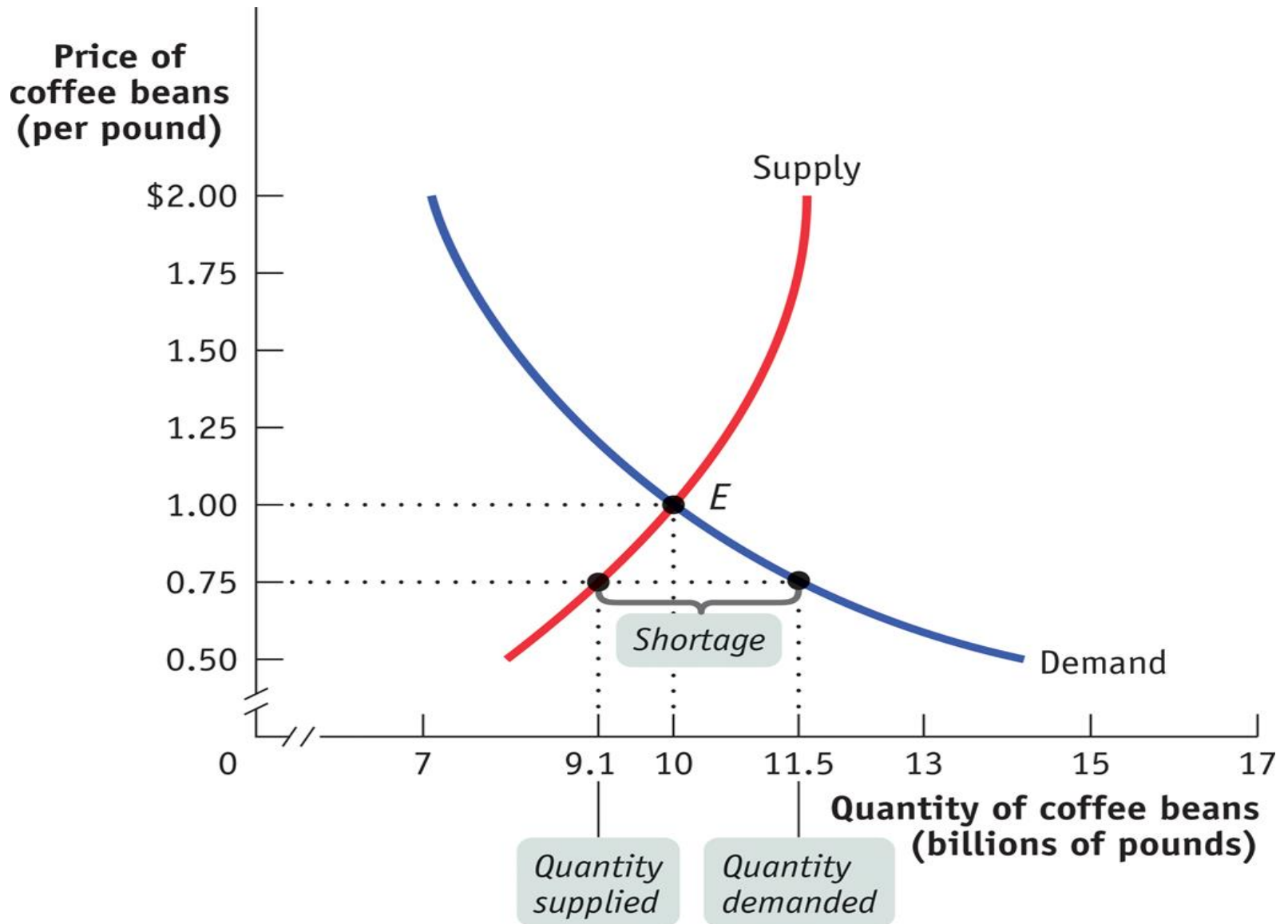
D decreases



ANOTHER EXAMPLE USING COFFEE TO GO WITH YOUR BURGER



A price above equilibrium creates a surplus



A price below equilibrium creates a shortage

- Increase in demand = 's higher equilibrium price and a higher equilibrium quantity.
- Decrease in demand = 's lower equilibrium price and a lower equilibrium quantity.
- Increase in supply = 's lower equilibrium price and a higher equilibrium quantity.
- Decrease in supply = 's higher equilibrium price and a lower equilibrium quantity.

For Example

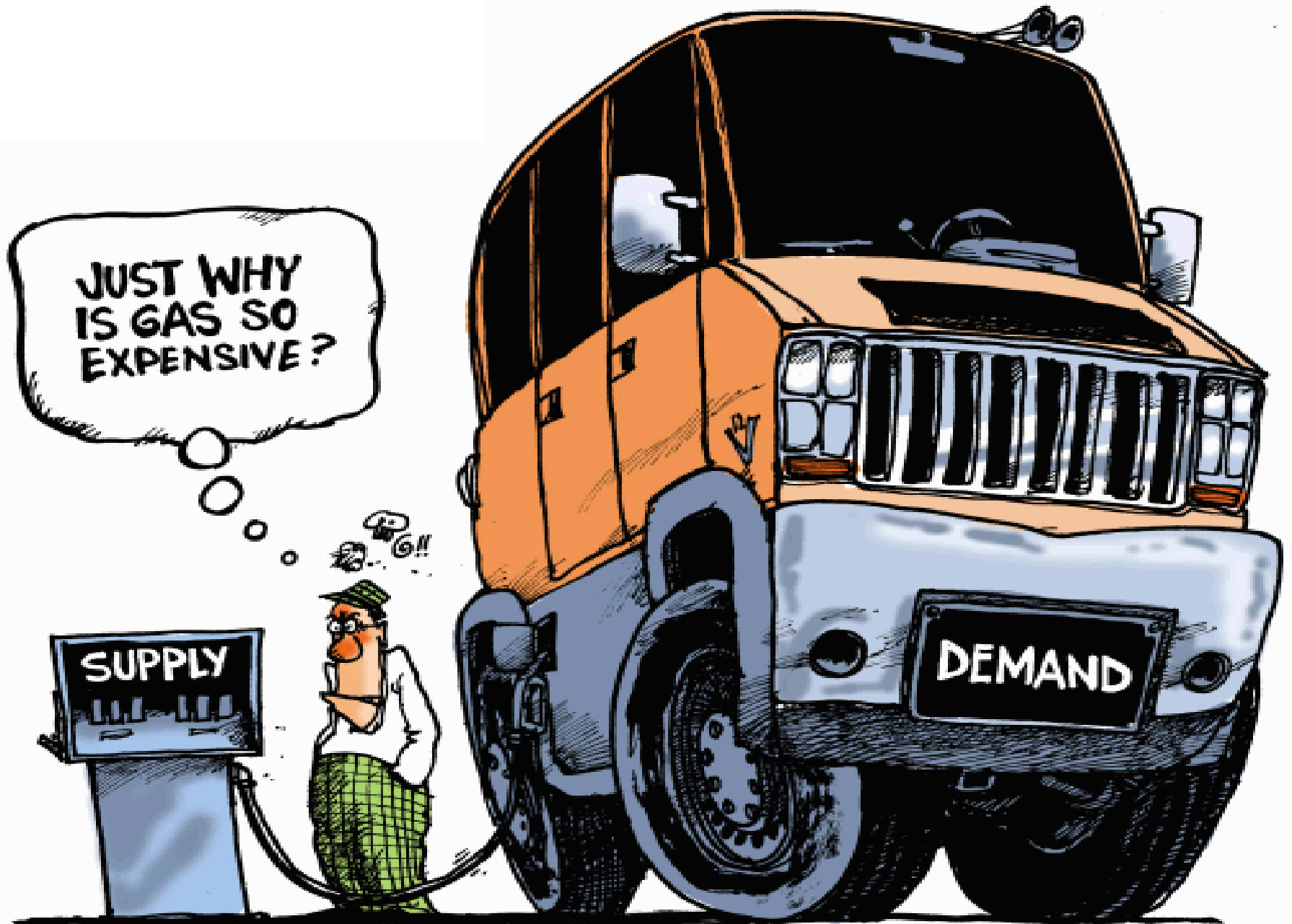
- An increase in the supply of grapes and a decrease in the demand for wine led to lower wine prices in 2001.
- An increase in the price of jumbo tires used on mining equipment led to higher prices for copper, coal, and zinc in 2006.



The equilibrium price aka the market-clearing price.

- When supply and demand change, equilibrium price and output change.
- When only one curve shifts, the resulting changes in equilibrium price and quantity can be predicted.
- ***But when both curves shift, we can only predict the change in equilibrium **price** in some cases, and the change in equilibrium **quantity** in others, but never both.***

Use a S&D graph to explain this double shift



Answer the following Question

- The price of cameras decreases and people buy more cameras, this can be explained by:
 - A) an increase in demand for cameras.
 - B) an increase in the supply of cameras.
 - C) a decrease in demand for cameras.
 - D) A decrease in the supply of cameras.

- The price of cameras decreases and people buy more cameras, this can be explained by:

A) an increase in demand for cameras.

B) an increase in the supply of cameras.

Correct!

C) a decrease in demand for cameras.

D) A decrease in the supply of cameras.

Government Involvement

Module 8 & 9

#1-Price Controls: Floors and Ceilings

#2-Import Quotas

#3-Subsidies

#4-Excise Taxes

#5-Quantity Controls

So Why are there Price Ceilings (aka Maximum Legal Prices)

- Political Pressure
 - Persistent Shortage of a Good or Service
 - Continuing Black Market (illegal) Activity
-

Examples of Price Ceilings include

1. WWII Wage Controls
2. Oil Shortages in the 1970s
3. NYC Rent Controlled Apartments

So Why are there Price Floors? (aka Minimum Prices)

- Political Pressure
 - Lack of Economic Understanding
 - Benefit Some
-

Examples of Price Floors include

1. Agriculture (Farm Products)
2. Minimum Wage
3. Air Travel (until the 1980s)

KEY TO PRICE CONTROLS

- IF the assumption is that markets are operating efficiently before any government intervention then such interventions will cause problems
- IF markets were operating inefficiently then such interventions might not cause problems and could move the market closer to efficiency.



#2 Import Quotas

**A quota is a limit on the number of imports.
The government sets the maximum amount that
can come in the country.**

Purpose:

- To protect domestic producers from a cheaper world price.**
- To prevent domestic unemployment**

#3 Subsidies

**The government just gives producers money.
The goal is for them to make more of the goods
that the government “thinks” are important or
“politically are necessary for re-election.”**

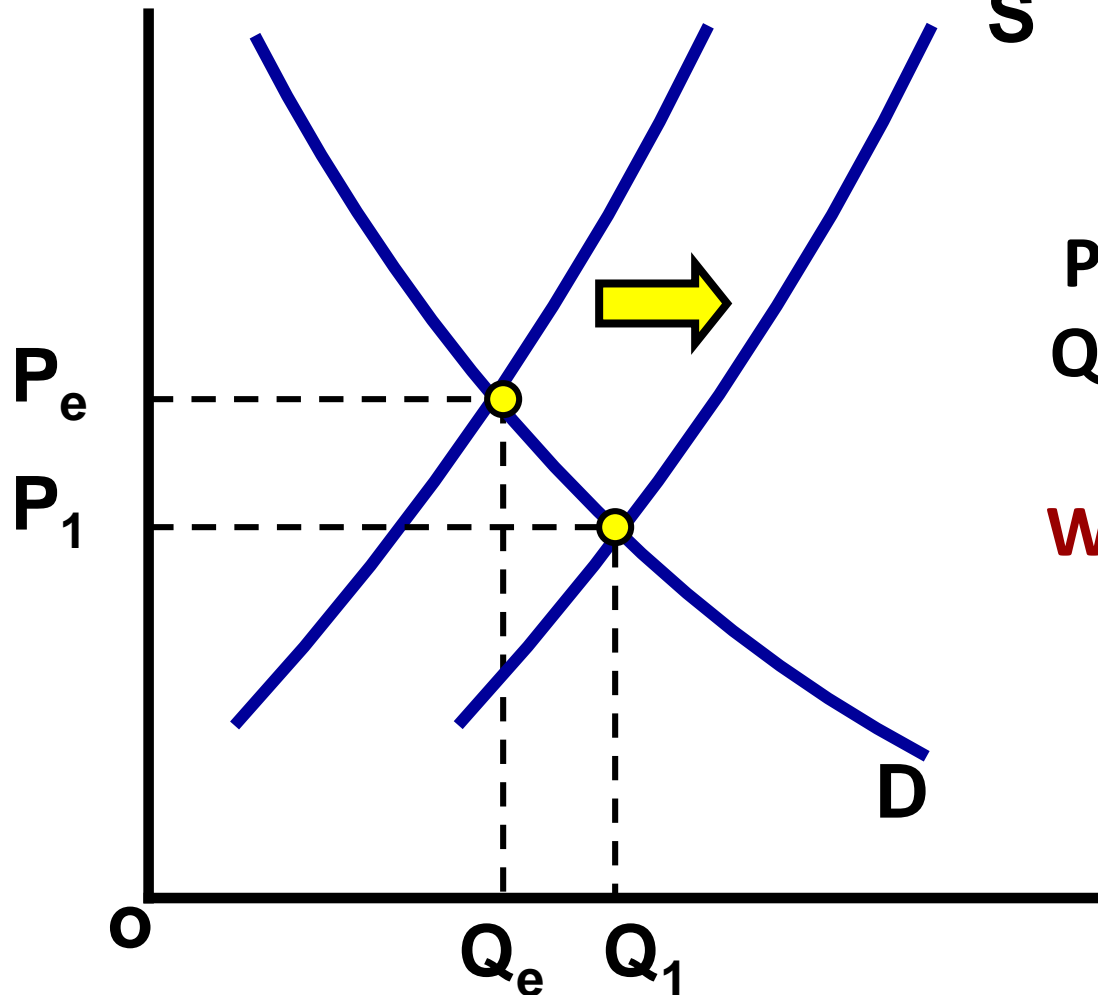
Ex:

- **Agriculture (to prevent famine)**
- **Pharmaceutical Companies**
- **Environmentally Safe Vehicles**
- **FAFSA (for you guys going to college)**



Result of Subsidies to Corn Producers

Price of Corn



S Subsidy

Price Down
Quantity Up
**Everyone
Wins, Right?**

NO

Quantity of Corn

#4 Excise Taxes

Excise Tax = A per unit tax on producers

This is similar to a Sales Tax that is Put on Consumers
For every unit made, the producer must pay \$
The goal is for them to make less of the goods that the government deems dangerous or unwanted.



Ex:

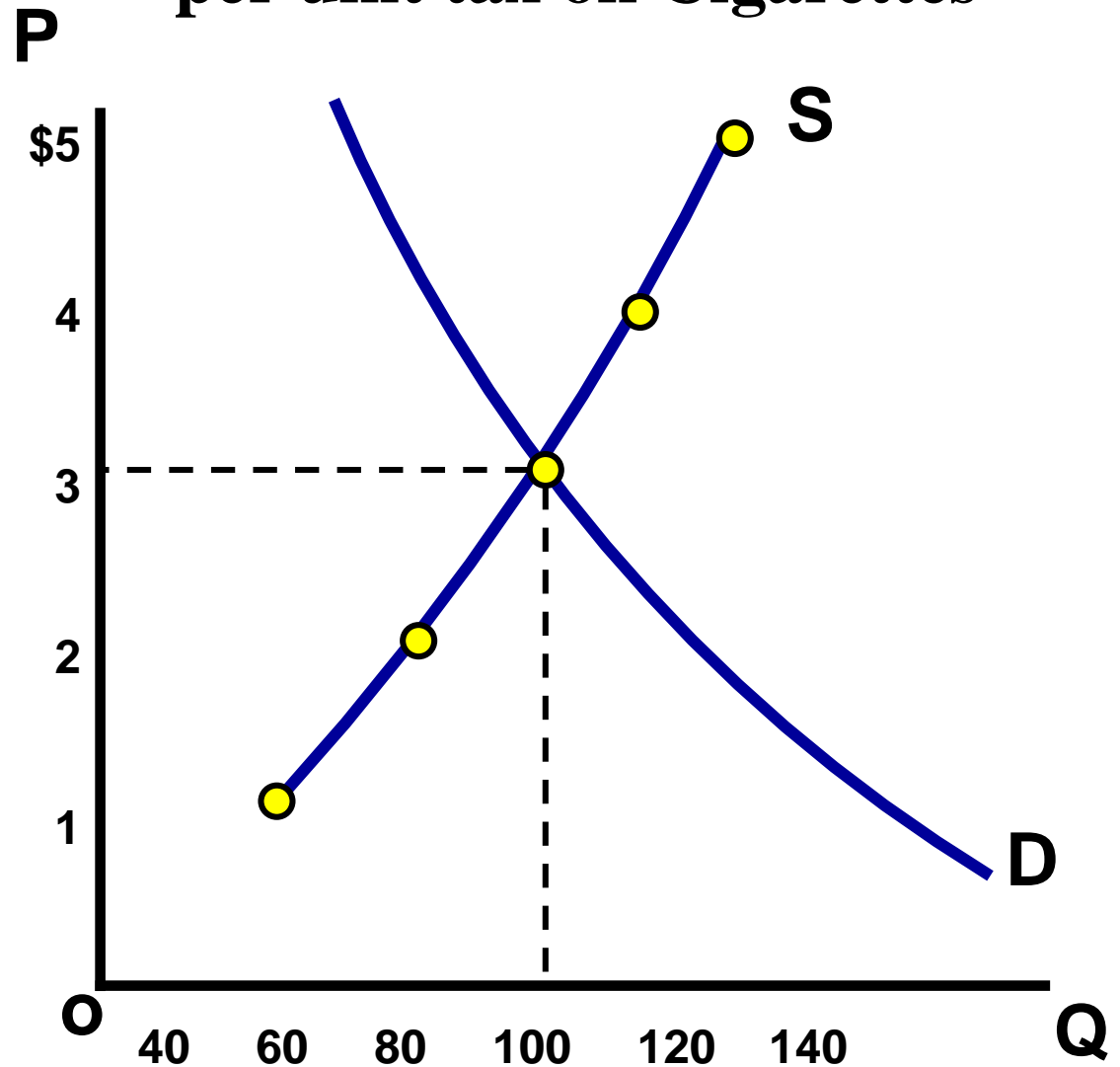
- **Cigarettes “sin tax”**
- **Alcohol “sin tax”**
- **Tariffs on imported goods**
- **Environmentally Unsafe Products**

Before Excise Tax There is Equilibrium

Supply Schedule

P	Qs
\$5	140
\$4	120
\$3	100
\$2	80
\$1	60

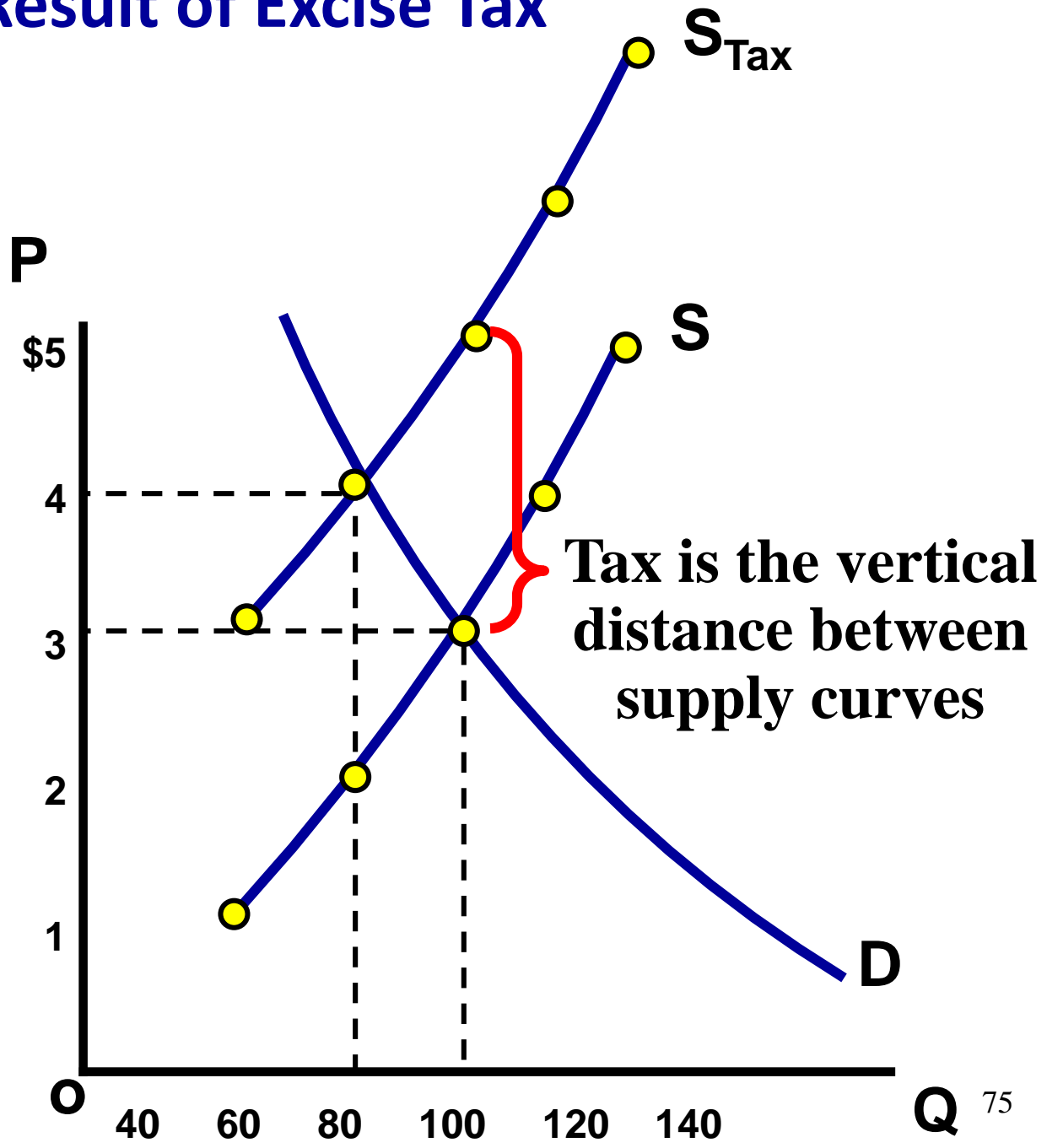
But Then Government sets a \$2 per unit tax on Cigarettes



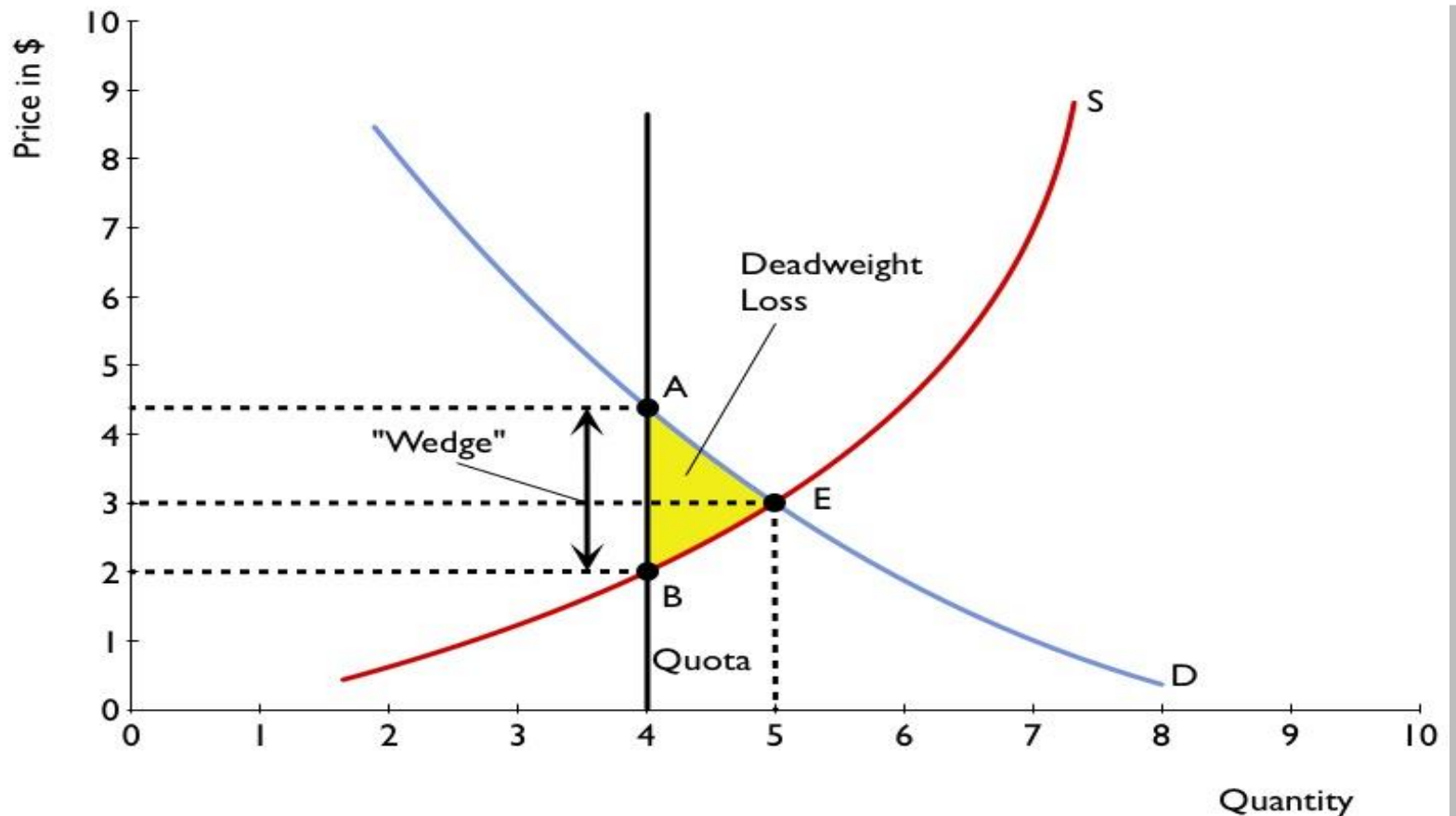
Result of Excise Tax

Supply Schedule

P	Qs
\$5 \$7	140
\$4 \$6	120
\$3 \$5	100
\$2 \$4	80
\$1 \$3	60



Quantity Controls or Quotas Regulate Amount that can be bought or sold of a Good but this causes a **WEDGE** between demand price and supply price.



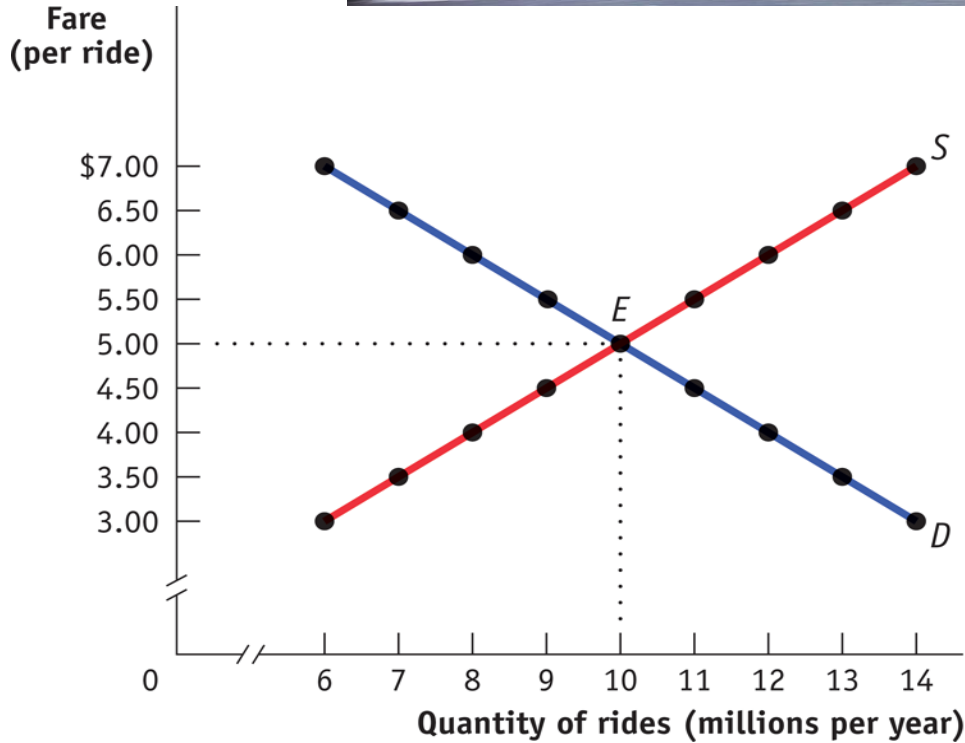
- There are many side effects to Quantity Controls or Quotas on Prices:

1. Missed Opportunities (inefficiencies)

2. Lost Gains from the Missed Opportunities
(aka Dead Weight Loss)

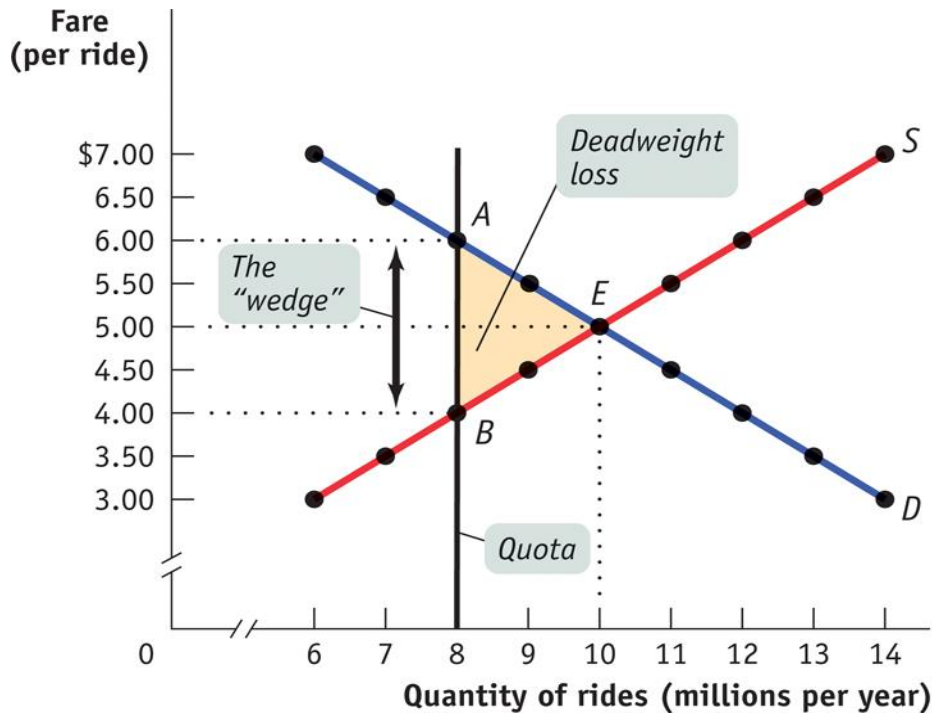
3. Encourage Evasion (aka law breaking)

As example: Lets consider NYC Taxicabs



Fare (per ride)	Quantity of rides (millions per year)	
	Quantity demanded	Quantity supplied
\$7.00	6	14
6.50	7	13
6.00	8	12
5.50	9	11
5.00	10	10
4.50	11	9
4.00	12	8
3.50	13	7
3.00	14	6

MARKET FOR TAXI RIDES WITHOUT GOVERNMENT CONTROLS



Fare (per ride)	Quantity of rides (millions per year)	
	Quantity demanded	Quantity supplied
\$7.00	6	14
6.50	7	13
6.00	8	12
5.50	9	11
5.00	10	10
4.50	11	9
4.00	12	8
3.50	13	7
3.00	14	6

Effect of a Quota on the Market for Taxi Rides