

## I. THE RUDIMENTS OF DEMAND

### GOALS OF SECTION

- 1) Explain the determinants of demand.
- 2) Explain the law of demand.
- 3) To apply what you have learned about demand to explain changes that will occur. For example from weather, income, technology, taxes advertising and so forth.
- 4) Introduce concepts of elasticity of demand and consumer surplus.

#### A. Simplifying assumptions:

1. People are motivated to economize.
2. They make informed choices.
3. Start with the market for motor bikes.
4. Market is competitive, which in practice means that markets are characterized by:
  - a large number of producers.
  - free entry and exit.

Note: Broader than a single market - demanders

(consumers) decide whether to buy this product relative to some other good.

Point: we are studying this product relative to all other goods and services produced in economy.

## B. Demand curve

1. Consumer problem: to be as happy as possible (max utility)

“Shows highest price consumer would be willing to pay for last unit consumed.”

2. Price changes: movements along the demand

- change in price from 2000 to 1000 → change in quantity demanded from 40 to 65 (change in the quantity demanded)



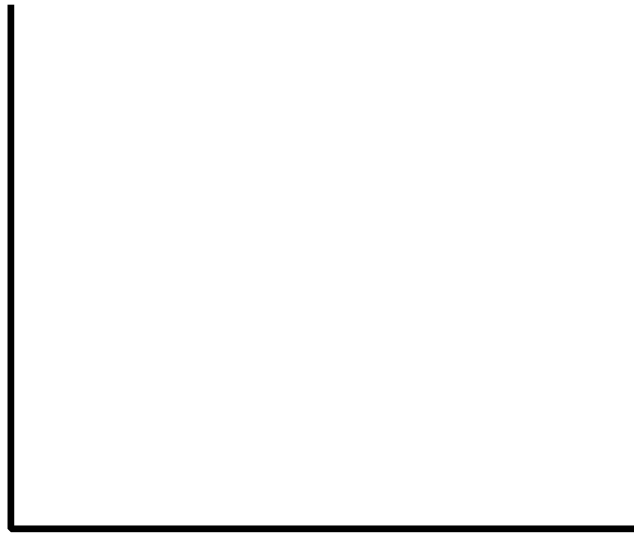
- the “law” of demand: negative relationship or negative slope

$$\text{slope} = \text{rise/run} = \Delta \text{vertical} / \Delta \text{horizontal} = \Delta P / \Delta Q$$

$$\text{slope} = (2000 - 1000) / (40 - 65) = 1000 / (-25) = -40$$

- if price increases by \$40 then the quantity decreases by 1.

C. Shifters of demand (shift from  $D_1$  to  $D_2$ )



1. tastes: increased preference for motor bikes due to X-games.

- advertising: shift from  $D_1$  to  $D_2$  (+?)

2. income: increase in income

- normal good: shift from  $D_1$  to  $D_2$  (+)
- inferior good: shift from  $D_2$  to  $D_1$  (-)

3. price of related goods: increase in the price of cars (gas)

- substitute goods - shift from  $D_1$  to  $D_2$  (+)
- complementary goods - shift from  $D_2$  to  $D_1$  (-)

4. number of consumers

- increase in population: shift from  $D_1$  to  $D_2$  (+)

5. Other shifters

- wealth: increase in the stock market (+)
- expectations: expect price to go up in the future (+)

## D. Using demand (and supply) to explain market changes

### 1. Example 1: Voluntary Import Restrictions on Motor Bikes

question: movement along or shift?

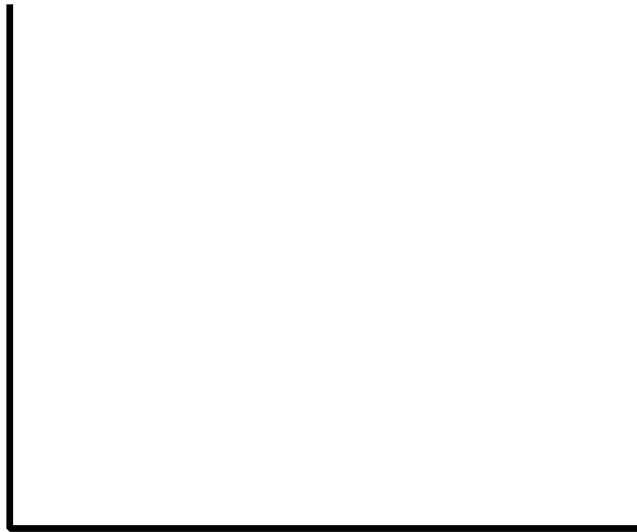


answers: movement along or decrease in the quantity demanded

note: implicitly a change in supply which will talk about next

## 2. Example 2: a recession

question: movement along or shift?



answer: shift or decrease in demand

note: the absence of the word quantity above because a shifter has changed

## E. Consumer Surplus

### 1. Definition:

- the difference between what the consumer is willing to pay and has to pay.
- the area below the demand above the price.

## 2. Example: motor bikes



calculation:  $cs = (u+t) - (t) = u = (1/2) b \cdot h = 32,000$

## 3. Application: buy ticket to 6 flags get second ticket at half price



price discrimination: appropriating consumer surplus

## F. Price Elasticity of Demand

### 1. Definition

- a “unit-free” measure of consumer price responsiveness.

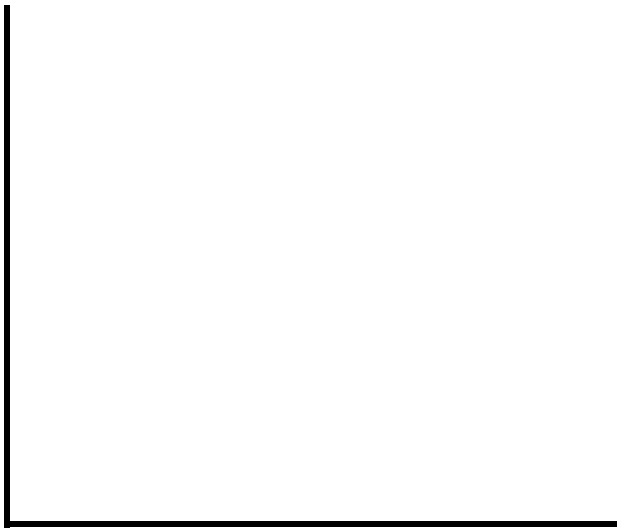
$$\epsilon_D = \left| \frac{\% \Delta Q}{\% \Delta P} \right| = \left| \frac{\Delta Q / Q}{\Delta P / P} \right| = \left| \frac{1}{\text{slope of demand}} * \frac{P}{Q} \right|$$

### 2. Critical value is “1”: three possibilities:

$\epsilon_D > 1$  elastic ( $\% \Delta Q > \% \Delta P$ )

$\epsilon_D = 1$  unit elastic ( $\% \Delta Q = \% \Delta P$ )

$\epsilon_D < 1$  inelastic ( $\% \Delta Q < \% \Delta P$ )



### 3. Relationship to linear demand

- suppose price is \_\_\_\_\_  
then quantity is   0    $\epsilon_D =$   
\_\_\_\_\_

- suppose price is \_\_\_\_\_  
then quantity is \_\_\_\_\_  
(middle quantity)  $\epsilon_D =$   
  1  

- suppose price is   0    
then quantity (max quantity)  
is \_\_\_\_\_  $\epsilon_D =$  \_\_\_\_\_

Moral: elasticity of demand changes along a linear demand curve.  $\epsilon_D = \infty$  at (0 quantity);  $\epsilon_D = 1$  at mid most quantity;  $\epsilon_D = 0$  at maximum quantity.

### 3. Application: maximizing student tuition revenue

P (thousands)	Q (in thousands)	TR=P*Q
10	0	0
9	2	18
8	4	24
7	6	42
6	8	48
5	10	50
4	12	48
3	14	42
2	16	24
1	18	18
0	20	0

- elastic

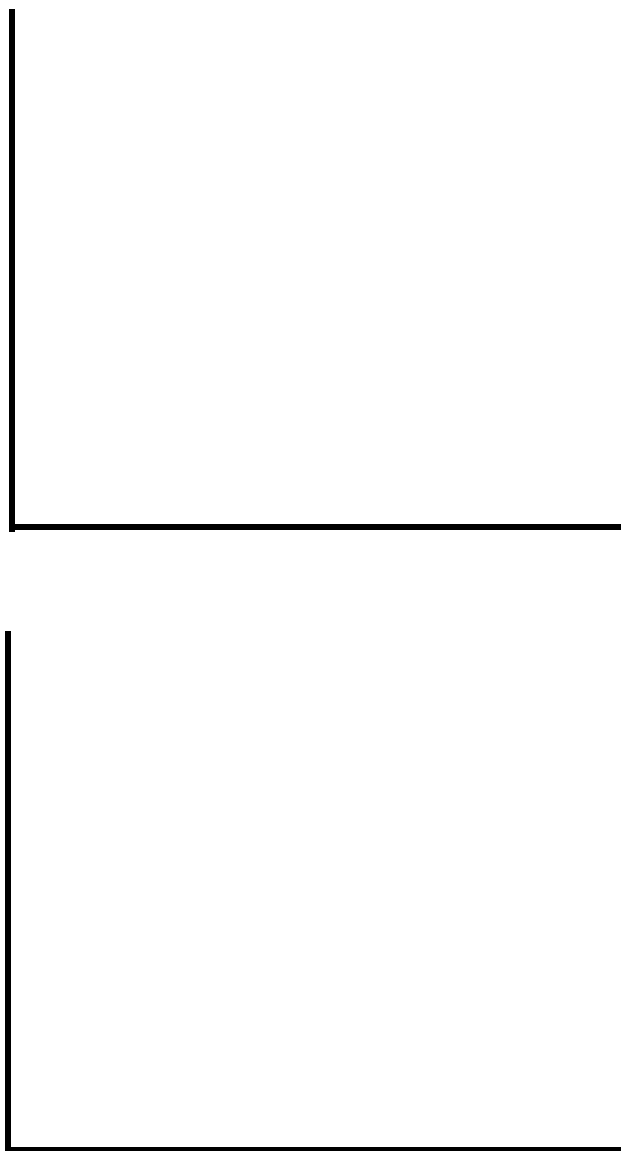
$$P \downarrow * Q \uparrow \uparrow = TR \uparrow$$

- unit elastic

$$P \downarrow * Q \uparrow = TR \text{ constant}$$

- inelastic

$$P \downarrow \downarrow * Q \uparrow = TR \downarrow$$



Question: Where would university set its price to maximize its profit?

Answer:

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Note: research suggests that demand for college is relatively inelastic.

#### 4. Determinants of the elasticity of demand

- luxury versus necessity.
- the fraction of the consumers budget.
- the number of substitutes.
- time.

## II. RUDIMENTS OF SUPPLY

### GOALS OF SECTION

- 1) Explain the determinants of supply.
- 2) Explain the (almost) law of supply.
- 3) Explain concepts of producer surplus and elasticity of supply.

## A. Assumptions

### 1. Firms maximize profit:

“firms sell as long as additional benefit  $>$  additional cost”


“shows lowest possible price supplier would be willing to sell product last unit sold.”

### 2. Market is competitive: many sellers such that firm has no influence over price.

## B . Supply Curve

### 1. Price changes: movements along the supply



2. increase in price from 1000 to 2000 increase in quantity supplied from 15 to 40  positive slope (+)

3. The (Almost) Law of Supply: The quantity supplied of a good or service is usually a positive function of the price. Occasionally tech. can  $\Delta$  significantly & the supply curve will be downward sloping. Since this is exceptional we will overlook this possibility.

4. Why does higher price cause firms to supply more?

- higher price motivates existing firms to produce more because profits are more likely.
- the law of diminishing returns means firms must obtain a higher price to cover costs.

### C. Shifters of the Supply Curve

1. Shifters that change the marginal cost

- change in input costs (land, labor, capital, entrepreneurship)
- changes (improvements) in technology

2. Other shifters

- number of firms
- firm expectations

D. Using supply (and demand) to explain market changes

1. Example 1: tariff placed on Japanese motor bikes

question: movement along or shift?



answers: shift  
or decrease in  
supply (note:  
absence of the  
word quantity)

## 2. Example 2: a recession that harms consumer expectations and lowers price of motor bikes

question: movement along or shift?



answer:  
movement  
along supply  
curve (shift in  
demand)

## E. Producer Surplus -

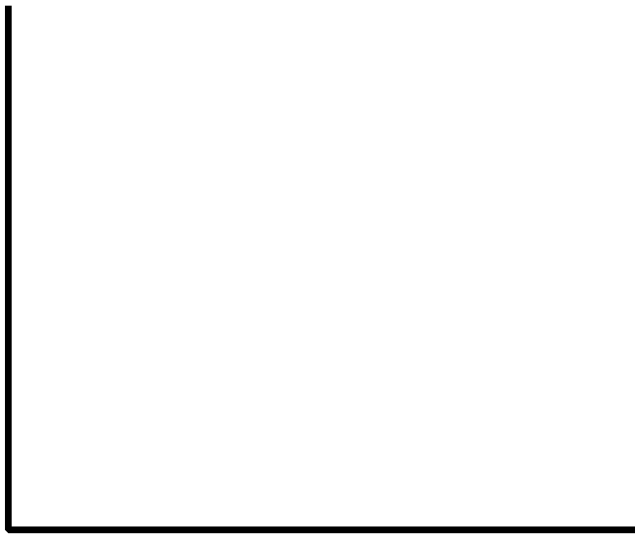
### 1. Definition

-difference between what suppliers are willing to accept and have to.

- area below the price above the supply

## 2. Calculation:

$$e = (e+z) - z = (1/2) b * h = (1/2) 15 * 600 = 450$$



## F. Price Elasticity of Supply

1. Measure of firm responsiveness to the price.
2. Same definition as demand (except absolute value is dropped because slope is positive).

$$\varepsilon_s = \frac{\% \Delta Q}{\% \Delta P} = \frac{\Delta Q / Q}{\Delta P / P} = \frac{1}{\text{slope of supply}} * \frac{P}{Q}$$

3. Again Related to slope: steeper supply the less elastic the supply curve



### III. MARKETS, EQUILIBRIUM, CHANGES IN EQUILIBRIUM & GOVERNMENT INTERVENTION

#### GOALS FOR THIS SECTION

- 1) Examine how markets achieve equilibrium
- 2) Examine properties of equilibrium
3. Examine how the equilibrium responds to forces outside the market.
4. Study the effects of price floors and ceilings.

#### A. National Market For Motor Bikes

##### 1. Definition of equilibrium:

- a price or quantity at which there is no tendency for price or output to change.
- this means the price must be at the level where the quantity demanded and the quantity supplied is equal.

2. Note that (1) D & S curves are based on consumers and producers doing the best they can, and (2) the price provides information and motivation to bring the market to equilibrium.

3. Equilibrium in the market for motor bikes: point A.

-  $Q_S = Q_D = 40$   
at  $P = \underline{\hspace{2cm}}$ .

- both gain:  
cs:  $c = 32,000$   
ps:  $h = 32,000$   
(note: not always equal)



#### 4. Equilibrium is stable

price above equilibrium price yields an excess supply or a \_\_\_\_\_, which tends to put downward pressure on the price (sale)

price below equilibrium price yields an excess demand or a \_\_\_\_\_, which tends to put upward pressure on the price.

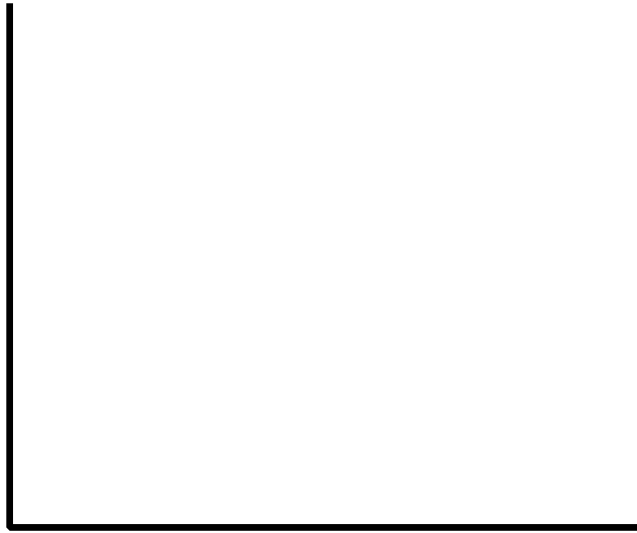
## 5. Equilibrium is efficient

- the general concept of efficiency: It is impossible to find a transaction that would benefit a buyer, a seller or a third party affected by the transaction.
- in this context note:  $MB=MC$  such that (1) buyers get the most of what they value; (2) = sellers maximize their profits.
- note 2 assumptions: (1) spillovers are assumed not to exist; factors of production are paid the value they add to production (factor markets are competitive).

The above describes what Adam Smith referred to as The Invisible Hand.

## B. Changes in the Equilibrium

### 1. Increase in income



- equilibrium price & quantity increase
- demand: increase in demand (shifts demand)
- supply: increase in the quantity supplied (moves along supply)

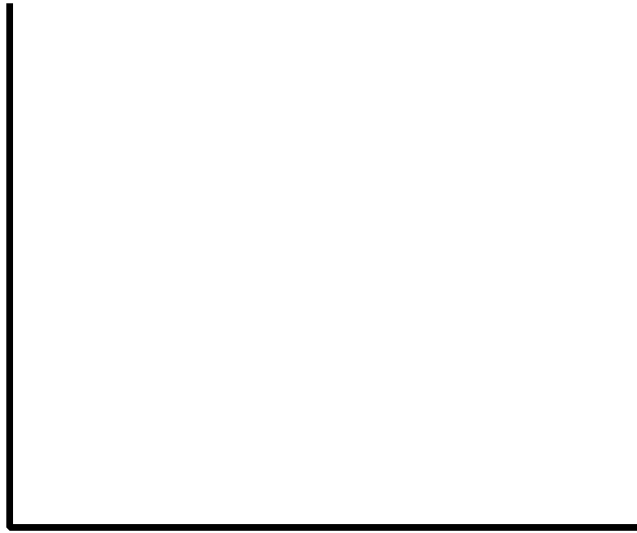
2. Chinese government starts a program to encourage production of motor cycles.



- equilibrium price increases
- equilibrium quantity decreases
- demand: decrease in quantity demanded (move along demand curves)
- supply: decrease in the supply (shift in supply curve)

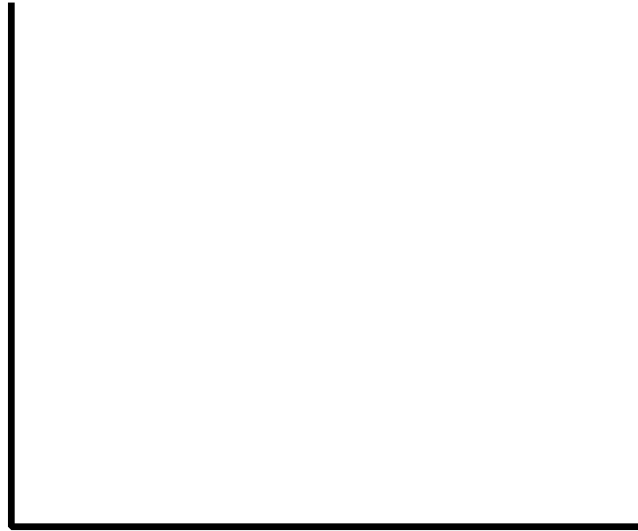
## C. Government Interference: Price Floors and Ceilings

### 1. Example 1: price floors and the market for cheese



- government must buy up extra cheese - give it away.
- note: price floor is inefficient  $MB < MC$  of the cheese.

## 2. Example 2: price ceiling and the market for rental apartments



- price floor leads to a shortage of apartments; tends to lead to landlords skimping on other dimensions such as upkeep of apartment and to not build additional apartments to meet demand
- note: price ceiling is inefficient;  $MB > MC$  of an additional apartment

### 3. What's the Basis for Government Intervention?

- competition is not perfect
- significant spillovers exist. (cheese rationale)
- significant time delays may be involved in reaching equilibrium (Topic for macro sections of course).
- the distribution of income may be judged inequitable. (rent control rationale)

we will examine some of these possibilities later on in the class