

# Economics and the Economy

# Chapter 1

## 1. WHAT IS ECONOMIC

-how society decided to distribute scarce resources in determining

- what
- how
- whom to produce for

-we have limited resources and we desire an endless quantity of goods and services

-we tend to understand why some economies grow and why others don't

- Decisions made by society (composed of individuals, organizations, government= Agents)
- We call economics both a science and a social science
  - Science because of method (math, stats)
  - Social Science because its dealing with relationships between agents
  - Example: Our welfare system vs. education or employment insurance vs training programs
- Specifically economics is trying to address *what* (goods/ services) to produce, in what cannot and
  - Ig. Coffee Shops and restaurants, shopping malls
- *How* to produce them
  - Ig. Shoes → technology or man made and cars
- For *whom* to produce
  - Agents → a. consumers/ households: food, clothing
  - b. firms: oil gas
    - c. society: private goods ( and public goods, medicare/education)
- Supplier of public goods: government

## 2. RESOURCE ALLOCATION

-assigning available resources in an economic way

Example: oil market prices increase OPEC (Organization of Petroleum Exporting Countries)

How: use more fuel efficient things

What: switch to solar, electricity, wind

Whom: consumers

Example #1: Oil market... What happens if price of oil increases?

- Consumers: take public transit a fuel efficient car, less consumption of oil
- Firms: input price increases profit, they find alternatives like they will switch to natural gas, wind solar or biotech
  - OPEC → organization of petroleum exporting countries
  - 1873 they decided to decrease tighten oil supply
  - Monoplitarian profit

Example #2: Table 1 World Population and income in 2005

- What are the key factors for economic growth (GDP)?
  - 1. Investments: capital/ savings

- Level of education
- Type of resources
- Technology
- Peace
- 2. Institution/ Property Rights, incentives matter
  - Type of government
  -

### **3. SCARCITY AND THE COMPETING USE OF RESOURCES**

#### **a. The Economy's Production Possibilities**

**Productions Possibility Frontier (PPF):** for each output of one good, the maximum amount of the other with given resources and technology

- Concave form
- Straight Line
- Convex Form

Ipads vs PCS

Production combinations → from point A to B

(See graph)

**Opportunity Cost:** the cost of an activity in terms of value of the best alternative...it's the most desirable alternative to get what you want

The max amount you have to let go in order to get what you want

the amount of a good or service that must be sacrificed to obtain more of the first one

-the PPF with a straight line the opportunity cost will always be the same \*\*

#### Example #3: Opportunity cost example

- Pies or Sandwiches

Combined PPF

James:

- (0 sandwich + 8 pies)
- (1 sandwich + 6 pies)
- in order to increase 1 sandwich, James has to give up 2 pies
- 1 sandwich is equivalent to 2 pies
- Opportunity Cost of 1 Sandwich is 2 Pies
- For one pie james would have to sacrifice  $\frac{1}{2}$  a sandwich
- Cost of  $\frac{1}{2}$  a sandwich is  $\frac{2}{2}$  pies

John is more efficient at making pies

#### Example #1:

-Opportunity Cost Ex

	Jack	Jill
Ipad	5	10
Laptops	3	2

Opportunity cost of 1 laptop for Jack:

- 5 Ipads= 3 Laptops
- $5/3 = 3/3$
- $5/3$  Ipads= 1 Laptop
- the opportunity cost for 1 laptop for Jack is going to be equivalent to  $5/3$  Ipads

Opportunity cost of 1 laptop for Jill:

- 10 Ipads= 2 Laptops
- 5 Ipads= 1 Laptop

Who has a comparative advantage in producing laptops?

- Jack, because he can produce laptops at a lower cost compared to Jill

Who has a comparative advantage in producing Ipads?

- Jill, because
- 10 Ipads= 2 Laptop
- 1 Ipad=  $1/5$  Laptop

For Jack it would be

- 5 Ipads=3laptop
- 1 Ipads=  $3/5$  Laptops

**Production Efficiency:** the economies resources are being fully utilized  
 every point on the PPF is an **efficient** point  
 points inside the PPF are **not efficient** because they're not being fully used  
 points outside the PPF are **not attainable**

### **b. Expanding the Production Possibilities**

-our economy has grown for several reasons:

1. We have more capital
2. More people working
3. Technological Improvements
4. People are more educated and skilled

### **c. Opportunity Cost and Comparative Advantage As Guiding Principles**

-different individuals have different opportunity costs

-trade your skills

-by joining you save time

**Comparative Advantages:** ability to supply a product at a lower cost than a

## **4. THE ROLE OF THE MARKET**

**Markets:** buyers and sellers to make trade

We have 3 types of markets:

- 1. Free Market (The Invisible Hand):
  - governments don't intervene

- First mentioned by Adam Smith
- Price gives us incentives
  - Example: Government set a “quota” ( can not produce more then that amount) in cigarette markets so what will happen?
    - If we try to Intervene the price will be higher, and will generate a black market
  - Example: U.S
- 2. Mixed Market
  - Example: same as above
    - Government will balance “equity” and “efficiency”
    - Example: Sweden
- 3. Command Market (Command Economy):
  - the government does everything, how much to produce and how much the society should consume
    - Example: North Korea
  - Canada is in between free and mixed market

## 5. POSITIVE & NORMATIVE ECONOMICS

**Positive:** Offers objective and scientific views (facts)/ scientific explanations of how the economy functions

- What if income taxes increase, people will work less

**Normative:** Based on judgments

- Should we increase income tax?

## 6. ECONOMISTS THINKING:

- a) Incentives matter → universities are cheaper to attend, it will attract more students and the labor supply will be higher in the future
- b) Government Role → taxation, pollution, market failure
- c) Marginal Thinking →
- prices determine behavior
- Markets and trade play a key role in improving the economy
- property rights are vital to development
- public policy can improve well being (taxes and services)
- Marginalist Thinking (which is the best idea)

**Microeconomics:** individual decision making at bout household and firm level (understanding how individuals make decisions)

**Macroeconomics:** interested in the performance in the whole economy (GDP, Unemployment Rates)



# The Tools of Economic Analysis

## Chapter 2

### 1. THEORY & MODEL

**Theory:** is a logical view of how the world (society) and its parts work

- **Example:** Economic development vs. Global Warming

**Model:** is a *formalization* of the *elements* of a theory and based on *simplifying* assumptions it helps us to understand empirical relationships

→ Theory=Model

### 2. DATA

-are pieces of evidence about behavior

-two functions of data:

- They help to reveal and quantify theoretical relationships
- They can be used to test our model
  - **Example:** What if Concordia is the only University in Quebec? A lot more students, there is no causal relationship because there is no other alternative
  - **Example:** Inflation and economic boom, economic boom usually causes inflation

Types of data:

- **1. Time-Series data**
  - a one to one mapping between values and time
  - reflects a sequence of measurements at different points in time
  - high frequency data= data min by min
  - low frequency data= annual data
    - Example: Table in book
- **2. Cross Section Data**
  - a one to one mapping between values and a set of individuals
  - or groups at one point in time (A Snapshot)
  - recorded behavior of economic variables across different individuals
    - Example: Table in book
- **3. Longitudinal Data:**
  - we follow the same individual over a period of time
  - Involves both time-series and cross-section data
  -

### 3. INDEX NUMBERS

- an index number expresses data relative to a given base value
  - Example: Table in book
- Discuss and interpret data
- Index numbers let us make comparisons with the price patterns for other foods
- Index numbers are also averages
- Weighted average of component price index
- Example:

Oil	Natural gas	Coal
50%	30%	20%

### CPI Consumer Price Index (CPI)

- Average price level in the economy
- It is constructed to measure changes in the overall cost of living
- Average of fixed basket of goods and services
  - Inflation: prices increase
  - Deflation: prices decline

### Nominal Price Index

- the actual dollar price of goods or services

### Real Price Index

- $(\text{Nominal price index}/\text{consumer price index}) \times 100$
- Shows how much the price has risen or fallen relative to the overall rate of inflation
- Example: Table in book
- $= (\text{Nominal Index}/\text{CPI}) \times 100$

How to find it with the table:

**(Nominal) Base year index value:**

$$= \$330,000 \times (100/\$330,000) = 100$$

Index value in 2003

$$= \$395,000 \times (100/\$330,000) = 119.7$$

**real house price index:**

$$= (\text{Nominal Index}/\text{CPI}) \times 100$$

Apply the data from 1999 - 2004 (Table "Time-Series Data and House price index" )

$$= (131.52/110.01) \times 100 = 195.5$$

- Real house price index:
- $= (\text{Nominal Index}/\text{CPI}) \times 100$

Steps to find the Real Price Index:

- First you take the nominal price and use the formula to find the nominal price index (NPI)
  - Ex.  $(434k/330k) \times 100 = 131.52$  (NPI)
    - Then you take the NPI and divide it by CPI to find the real price index
  - Ex.  $(131.52/110.01) \times 100 = 119.95$

**4. ECONOMIC MODELS & AVERAGES**

- Cigarettes Market, Smoking Behavior
- $F(\dots)$  means function
- Measures quantity consumed
- Price is an important factor
- Smoking= $F(\text{price of cigarettes, peer pressure, messages, price of the patch})$
- Other things equal assumption...
- Graphs are simple two dimensional representations
- Economic behavior is influenced by many variable not in the two dimensions
- • Smoking bans in public places
- Take the simplest model by considering only prices, See table
- “tobacco sales and prices”

**5. INTERPRETING LINEAR RELATIONS**

- $P=280-4Q$
- Price and Quantity
- Slope shows the effect of change in Q on change in P
  - 1 unit change in Q
  - 4 units change in P
- Downward, negatively sloped
  - See graph “linear relationship”
  - Non-linear relationship
  - See graph “non-linear relationship” fatality rate of Canadian drivers 2006.

**Example:**

Assuming the consumer spends on average:

- 55% Rent
- 35% Food
- 1% Transport

	1990	1991	1992	1993	1994
tran	70	70	78	75	75
rent	1000	1000	1100	1120	1150
food	600	620	610	640	665

How to find CPI using only 3 goods (trans, rent, food)?

- **Step 1:** Find price index

	1990	1991	1992	1993	1994
tran	100	100			
rent	100	100			
food	100	103.33			

- **Step 2** CPI for 1990

	1990	1991	1992	1993	1994
tran	100	101.17			
rent					
food					

- $CPI = 100 \times 0.55 + 100 \times 0.10 + 103.33 \times 0.55 = 101.17$

Why do we have CPI: to see the trends over time

#### **4. CRITICISMS OF ECONOMICS**

1. No 2 economists ever agree
2. Models in economics are too simple to be considered realistic
3. People are not as mercenary as economists portray them to be
4. Actions of human beings cannot be reduced to scientific laws

# Demand and Supply

## Chapter 3

### 1. MARKET

- a set of arrangements in which buyers and sellers exchange goods and services
- price and quantity are jointly determined by both buyers and sellers

### 2. DEMAND, SUPPLY, AND EQUILIBRIUM

**Demand:** is the quantity of a good or service that buyers are willing to purchase at EACH possible price with all other influences on demand unchanged

- “Quantity demanded” is the amount purchased at a PARTICULAR price

**Supply:** is the quantity of a good/service that sellers are willing to sell at EACH possible price, with all other influences constant

- “Quantity supplied” is the quantity/ amount at a particular price (sell)
  - Example of demand and supply: In Book

**Equilibrium:** Price clears the market, the price at which quantity demanded equals the quantity supplied

**Excess supply:** Exists when the quantity supplied is larger than the quantity demanded at the ongoing price level

**Excess demand:** Exists when the quantity demanded is larger than the quantity supplied at an ongoing price level

### 3. DEMAND AND SUPPLY “FUNCTIONS” (CURVES/LINES)

**The Demand Curve:** is a two-dimensional graph of the demand function

**The Supply Curve:** is a two-dimensional graph of supply function

- When drawing them, all factors except price are constant
  - Example: Find a linear curve to represent the demand and supply
  - Demand
    - Intercept
    - Slope  $(1200-800)/(160-200) = -10$
    - $P = 2800 - 10q$
    - It's 2800 because when its 2800 demand is equal to 0
  - Supply
    - Intercept
    - Slope  $(1200-800)/(60-40) = 10$
    - $P = 1200 + 10q$
    - It is 1200 because when its 1200 the supply is 0

How to calculate the market equilibrium?? (show all steps on exam)

→ Quantity demanded = quantity supplied

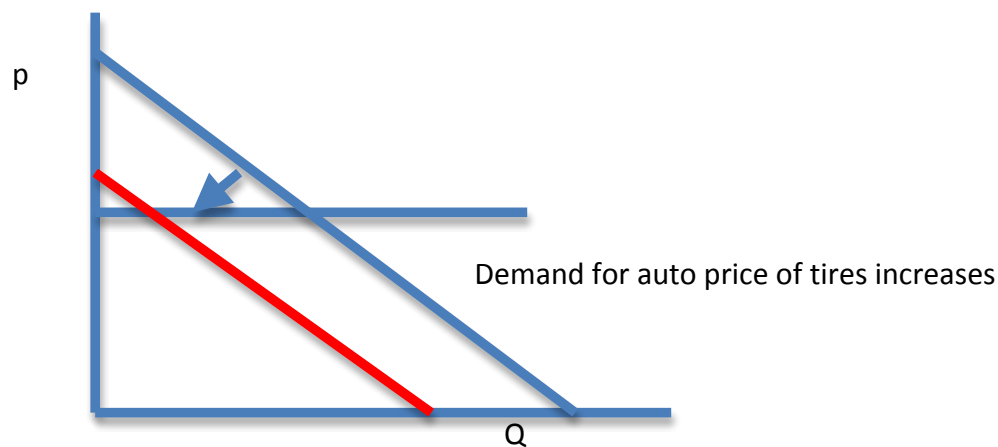
- Demand function:  $P = 2800 - 10q$
- Supply function:  $P = 1200 + 10q$
- $P = 2800 - 10q = 1200 + 10q$

- $1600=20q$
- $1600/20=q$
- $80=q$
- plug in  $q$  into the supply or demand function to find  $P$
- $P=1200+10(80)$
- $P=2000$

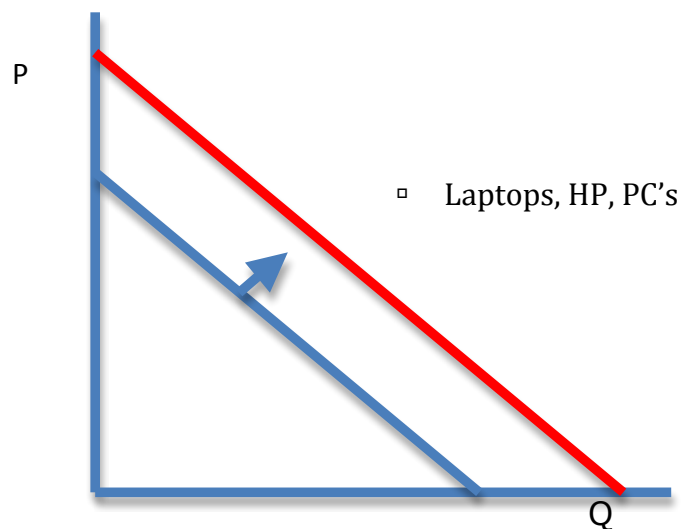
### Other things that can shift demand

#### 1. Prices of related goods:

- **complementary goods:** two goods are consumed together
  - cars and tires, without tires you can't drive the car



- **substitute goods:**



### **4. CONSUMERS INCOME LEVEL**

a. **Nominal Goods:** when you become richer you buy more

**b. Inferior Goods:** if you become richer you buy less of it

- If your income increase your demand will shift to the right
- If you have a decrease in income your demand will shift down

**c. Tastes or Fashions/Preferences:**

- Eg. Iphones, everyone likes it!
- Even if the price is high we will buy it

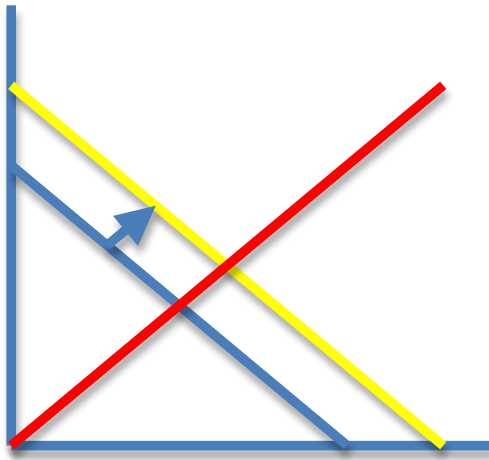
**d. Price Expectations:** when we make our decisions we look at the market price and make our decision, what we believe will happen in the future (good/ bad expectations)

- Eg. The stock market
- The housing market in the states (2008)

$$D = p = 2800 - 10q$$

$$S = p = 1200 + 10q$$

$$D' = p = 3200 - 10q$$



$$3200 - 2800 = 400$$

$$3200 - 10q = 1200 + 10q$$

$$20q = 2000$$

$$q = 100$$

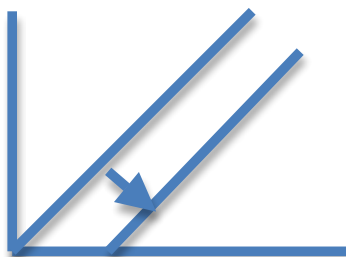
$$p = 3200 - 10 \times 100$$

$$p = 2200$$

## **5. THINGS TO CHANGE "SUPPLY"**

### **1. Technology**

- An improvement in technology will expand the supply



## 2. Effects of input costs

- 1) A fall in input costs expands the supply
- 2) A rise in input costs contracts the supply

## 3. Number of firms/suppliers in the market

- The greater number of firms, the greater the supply

### Examples:

#### Eg. #1: Expectations and the Price of Large Second Hand Cars

- The price of gasoline rises in 2012
- Cost of running big cars will rise
  - The price decreases
  - Q increases
  - Supply shifts as more individuals wish to sell their large cars
  - Demand shifts as buyers fear future higher gas prices

#### Eg. #2: Alberta Beef Market: The Power of One

- Mad Cow disease in May 2003
- Canadian consumers became very anxious about purchasing beef
- How did this affect everything?
  - Beef supply is redirected to Canadian Market (Increases)
  - Demand decreases as buyers fear about the disease
  - P decreases
  - Q decreases

#### Eg. #3: A Model of the Housing Market

- Was it primarily demand-side or supply-side forces that generated the price pattern?
  - Supply in 2002 is less than 1997
  - Demand was stronger due to higher incomes and lower mortgage rate
  - P increases
  - Q decreases

## 6. MANAGED MARKETS

-Price controls are government rules or laws that inhibit the adjustment of price to clear markets

### 1. Price Ceilings

- protect consumer

### 2. Price Floor

- protect supplier min wage

### 3. Quota

- are physical restrictions on output

- the price floor cannot be under the equilibrium price
- the price ceiling cannot be over the equilibrium

Example:

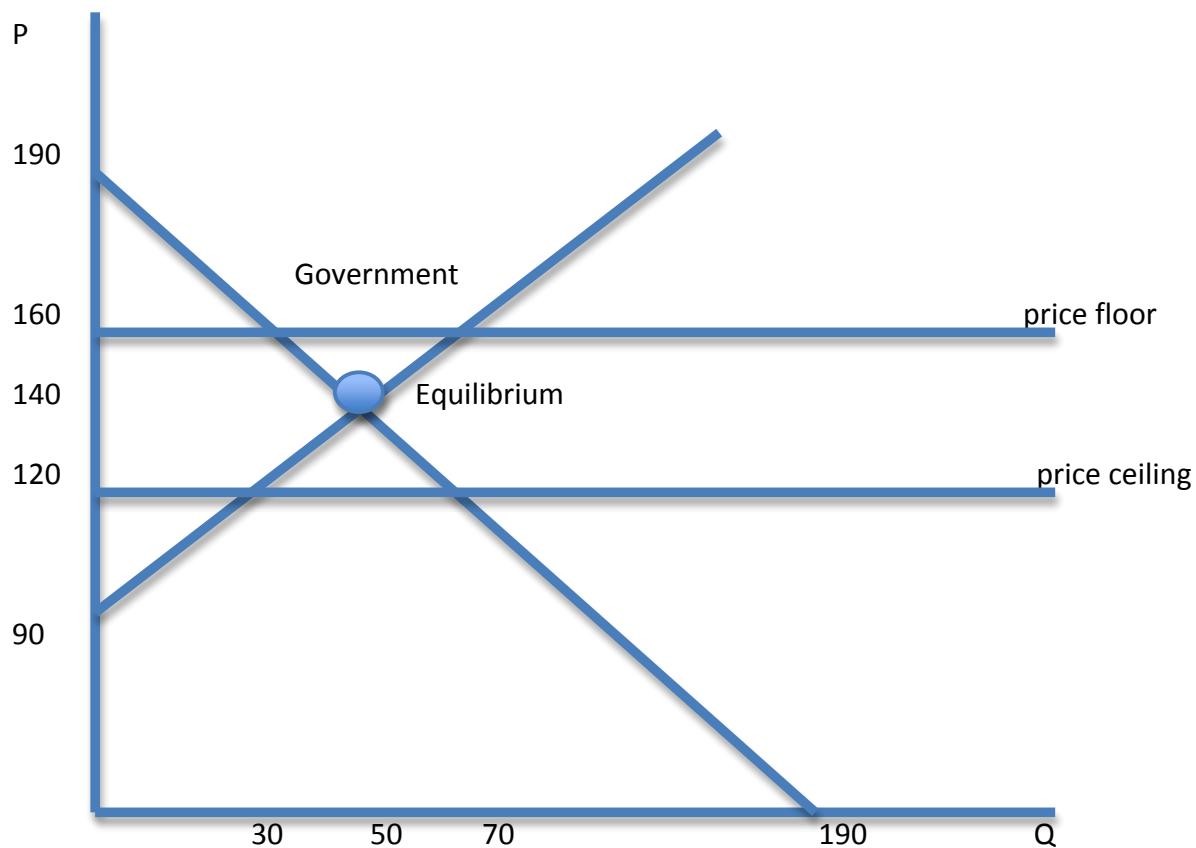
Demand  $\rightarrow P=190-q$

Supply  $\rightarrow P=90+q$

### Examples:

**Eg. #1.** Calculate equilibrium quantity price "q" and also the total revenue for the firm.

- $190-q=90+q$



- $190-q=90+q$
- $q=100/2=50$
- plug in 50 to find p

Total Revenue =  $P \times Q = 140 \times 50 = \$7000$

**Eg. #2.** Price floor=600

Government buys up excess supply

Calculate market price "q" "tr" and "cost of government"

- Demand:  $160=190-q$
- $Q=30$

- Supply:  $160=90+q$
- $S=70$ 
  - $(70-30)=40$
  - Cost of government:  $40 \times 160=6400$
- Total Revenue:  $70 \times 160=11200$

**Eg. #3** Consider the price for production subsidy  
Make sure that the firm maintains the same total revenue as in part 2.

Total revenue= 11200

Demand:  $p=190-70q$

- $P=120$

Government pays the price difference

( $P_s$ )  $P$  of supplier=160

( $P_c$ )  $P$  of consumer= 120

$Q=70$

Government Buy:  $70 \times (P_s - P_c)$

$=70 \times 40$

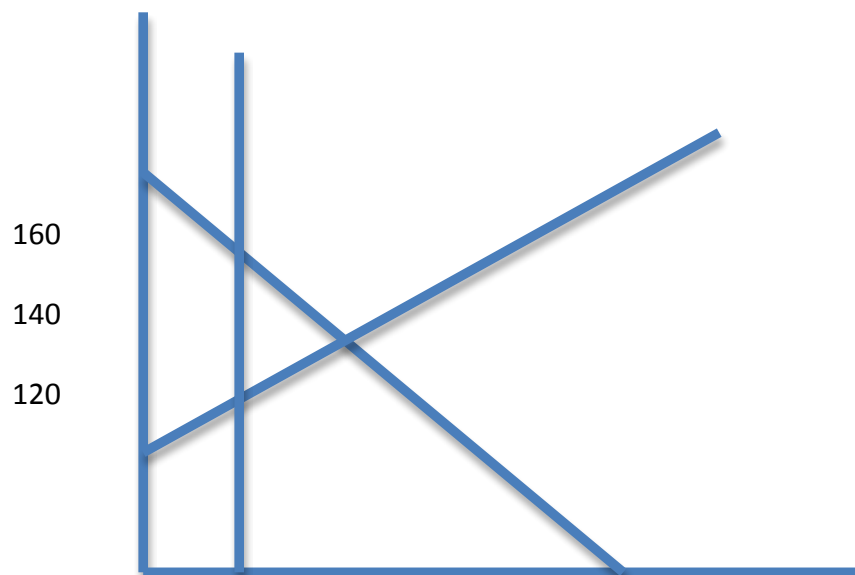
$=2800$

NOTE: If we compare the subsidy because government has less of a cost

- Sub=2800
- Price Floor=6400

**Eg. #4:** Quota of 30

Calculate  $P_c$ ,  $P_s$ , cost, and Tr



30      50

$$\begin{aligned}P_c &= 190 - q \\ P_x &= 190 - 30 \\ P_c &= 160\end{aligned}$$

$$\begin{aligned}P_s &= 90 + q \\ P_s &= 90 + 30 \\ P_s &= 120\end{aligned}$$

$$\begin{aligned}\text{Market price} &= \text{consumer price} = 160 \\ \text{Tr} &= 160 \times 30 = 4800\end{aligned}$$

What is the cost of government? There is no cost of government = 0  
Instead the government can collect revenue between 0-40 per unit

## Elasticity

## Chapter 4

**1. THE PRICE ELASTICITY OF DEMAND**

- The question is: by how much does quantity demanded change in response to a change in price?
  - Elasticity's are all about responsiveness (sensitivity)
  - In particular, we deal with responsiveness relative to the change in price

**Define:**

$E_d = \% \text{ change in quantity demanded} / \% \text{ change in price}$

Mathematically:  $\Delta q / \Delta p = \Delta q / \Delta p \times p / q$

Example: a 10% price increase reduces the quantity demanded by 20%

- $E_d = -20/10 = -2$

"-" means that P and Q move in *opposite directions*, usually omit "-".

-we usually don't write the - sign

**Arc elasticity:**

- Consumer responsiveness over a segment or ARC of the demand curve

Exp: Choosing reference point – Midpoint

- Average quantity =  $(Q_1 + Q_2) / 2$
- Average price =  $(P_1 + P_2) / 2$
- Price drops from \$12.5 to \$10.0 and Quantity demand goes from 0 to 200
- $E_d = \frac{\% \text{ change in quantity}}{\% \text{ change in price}} = \frac{(200-0) / ((0+200)/2)}{(10-12.5) / ((10+12.5)/2)} = \frac{200/100}{-2.5/11.25}$
- Take the ratio : -9= the are elasticity
- When the price changes by 1% the quantity will change by 9%

Example: Show table "arc elasticity"

Price	Quantity Demanded	Price Elasticity (Arc)	Price Elasticity (Point)	Total Revenue
1	2	3	4	5
12.50	0		-infinity	0
10.00	200	-9.0	-4.0	2000
7.50	400	-2.33	-1.5	3000
6.25	500	-1.22	-1.0	3125
5.00	600	-0.82	-0.67	3000
2.50	800	-0.43	-0.25	2000
0	1000	-0.11	-0	

**Point Elasticity:**

- Elasticity calculated at a particular point on the demand curve
- $200/400 / (-2/30) / (7/50)$
- Show table "point elasticity" \*table above\*

$$P=5-2q$$

$$P=3$$

$$Q=1c$$

$$2q=5-p$$

$$q=2.5-0.5p$$

$$\Delta q/\Delta p = -0.5$$

$$\frac{\Delta q \times p}{\Delta p \times q} = -.5 \times 3/1 = -1.5$$

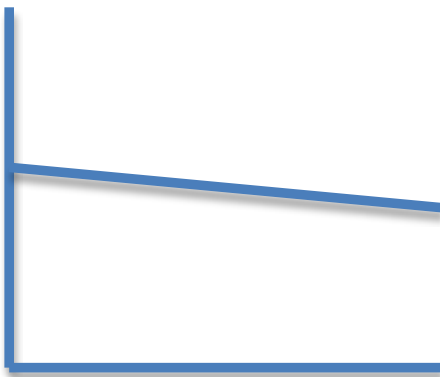
$$\Delta p \times q$$

### Revenue:

- show table "revenue"
- Elasticity varies along the demand curve.
- See graph "elasticity along demand"

### Extreme cases

- a. graph horizontal demand
- b. vertical demand.



### Horizontal Demand:

- flat demand curve=big change in quantity
- steep demand curve= small change in quantity
- horizontal demand the elasticity will be infinity

### Vertical Demand:

- The elasticity of demand will be equal to 0

### Elastic and Inelastic Demand

- Demand is **Elastic**:
  - when the price elasticity (ignoring the negative sign) is greater than 1
- Demand is **Inelastic**
  - when the price elasticity lies between 0 and 1

- Demand is **Unit Elastic**
  - when the price elasticity is exactly 1

### Factors that can affect Price Elasticity of demand

-The ease with which consumers can substitute another good

Example: Consider laptop markets

○ Consumers can readily substitute one brand of laptop for another if the price rises

○ So we expect demand to be **elastic** for a particular brand

○ But if all laptop prices rise, the consumer cannot switch

○ So we expect demand to be **inelastic** for laptops as a group

- Since it is difficult to find substitutes for life's necessities (e.g. food, shelter etc.) their demand is inelastic
- In contrast to necessities, luxury goods and services exhibit more elastic demand behavior

When Demand is **inelastic**- a supply shock will have large impact on price and little impact on quantity

When Demand **is elastic** the supply shock will only have small effect on price and a large impact on quantity

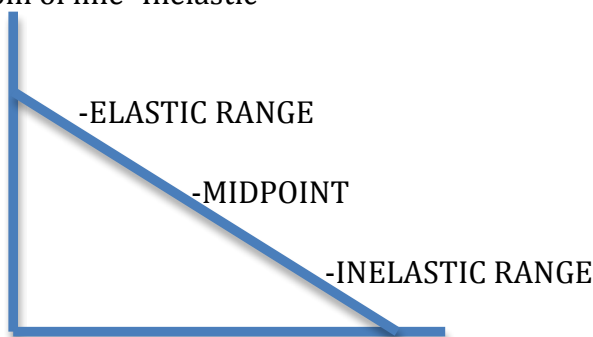
Application:

→ See graph "using price elasticity's" See graph "Elasticity and expenditure"

Price Elasticity and Total Expenditure

Top of line=Elastic

Bottom of line=Inelastic



Revenue (area) =  $P \times Q$

(Picture on phone)\*\*\*\*\*

Gain: B, EQA, QB

Midpoint=threshold

### Short-Run and Long-Run Elasticity:

- In the short run, less elastic (time is not enough for adjustment)
- If price changes persist, consumers are more likely to adjust

- Demand thus tends to be
  - more elastic in the long run ◦ but less elastic in the short run

### The Cross-Price Elasticity of Demand:

- The cross-price elasticity of demand for good x with respect to the price of good y is: math

$$\frac{\% \text{change in quantity demanded for } x}{\% \text{ change in price of good } y}$$

- This may be positive or negative
- The cross-price elasticity is positive “+” if two goods are substitutes e.g. Kindle and kobo ebook readers
- The cross-price elasticity is negative “-” if two goods are compliments e.g. popcorn and movie tickets

### Inflation and Demand Elasticity:

- Price inflation exists in most economies
  - e.g. All prices rose in 2009 by 2%
- When computing the price elasticity of demand for one good we use the price change of that good relative to the inflation rate
  - e.g. If good X increase in price by 5%, its quantity declines by 1%, and the inflation rate is 2%
  - then  $\frac{\text{change in } Q\%}{\text{change in } P\%} = -1\% / (5\% - 2\%) = -1/3\% = \text{Price Elasticity}$

## 2. THE INCOME ELASTICITY OF DEMAND

Definition: measures the sensitivity of quantity demanded to a change in income

$$\text{Formula: } \frac{\% \text{ change in } Q}{\% \text{ change in income}}$$

-The income elasticity may be positive or negative

### Normal and Inferior Goods:

- A Normal Good has a positive “+” income elasticity of demand
  - an increase in income leads to an increase “+” in demand
  - e.g. Most things we consume
- An Inferior Good has a negative “-” income elasticity of demand
  - an increase in income leads to a decrease “-” in demand
  - e.g. Kraft Dinner, fast food.
- A Luxury Good has an income elasticity of demand bigger than 1
  - It is a particular type of normal good → e.g. wine

### **3. ELASTICITY OF SUPPLY**

Definition: measures the sensitivity of the quantity supplied or produced to a change in price

$$\text{Formula: } \frac{\text{change supplied \%}}{\text{change in price \%}}$$

See graph " Alternative Supply Elasticity's" The Cross-Price Elasticity of Supply:  
(on phone) \*\*\*\*

-The cross-price elasticity of supply for good x with respect to the price of good y is:  
formula

-From point A, a shift in demand will induce a different quantity response, depending on the supply elasticity

If price of television cable services increases, what would happen to internet TV services?

### **4) ELASTICITY AND TAXES**

Will an increase in the tax rate really raise total revenue?

- Types of taxes
  - A fixed dollar levy per unit sold
  - Ad valorem tax (a percentage levy)
- Incidence of the tax
  - How the tax burden is shared between buyers and producers
- In most cases an increase or decrease in the tax causes a change in the equilibrium price
  - Therefore in examining tax incidence, one has to examine the "NET" effect of the tax on equilibrium

-See graph for "tax burden"

Example: Say the government charges fixed amounts of \$4 tax on producers  
(On phone)\*\*\*\*

## Welfare Economics and Externalities \*\*

## Chapter 5

**1. CONSUMER AND PRODUCER SURPLUSES**

-Important tools for determining economic efficiencies

Exp: "Valuation and Reservation of Apartment"

- **Consumer's Surplus:**
  - Is the difference between the consumers willingness to pay and what is actually paid
  - Is the vertical distance between market price and the individual individuals valuation
- **Producer's surplus:**
  - Is the differences between the producers willingness to supply and the price that he/she receives (Market Price)
  - Is the distance between the market price and the individual's reservation price

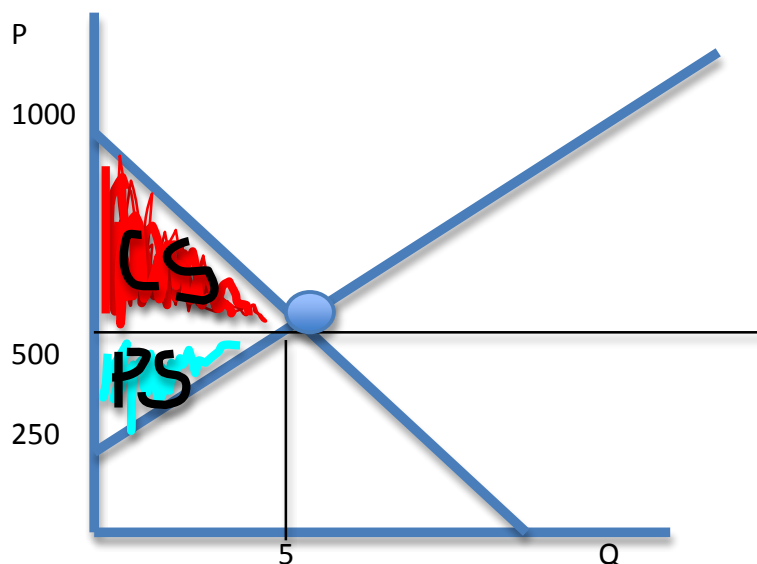
-The suppliers and demanders are willing to participate because they earn surplus

Exp: "Gain of the trade"

Computing the Surpluses :

- Demand:  $P=1000-100Q$
- Supply:  $P=250+50Q$
- Equilibrium:  $1000+10q=250+50q$
- $Q=5$
- $P=500$

→Graph and show Consumer Surplus (CS) and Producer Surplus (PS):



$$\begin{aligned}
 \text{CS} &= \text{Area of the Red triangle} \\
 &= \frac{1}{2} \times 5 \times (1000 - 500) \\
 &= 2.5 \times 500 \\
 &= 1250
 \end{aligned}$$

$$\begin{aligned}
 PS &= \text{Area of the Blue triangle} \\
 &= \frac{1}{2} \times 5 \times (500 - 250) \\
 &= 2.5 \times 250 \\
 &= 625
 \end{aligned}$$

Right side from the equilibrium the more you lose (LOSS)

The equilibrium point is the best part

Left side you haven't achieved your potential but you can still gain

## 2. EFFICIENT MARKET OUTCOMES

### Efficient Market:

- A. *Maximizes* the sum of producer and consumer surpluses
- B. *Leaves* no scope for additional agreements that would improve the financial status of participants
- C. *Marginal* benefits (demand) equals marginal costs (supply)

### The free market equilibrium is efficient

- At that equilibrium the marginal benefit (on the D side) from consuming one more unit equals marginal costs (on the S side) from producing one more unit

## 3. TAXATION AND EFFICIENCY

-the efficiency analysis can be issued on a tax incidence that is imposed in the S and D framework

-consider an *ad valorem* tax that is collected from suppliers

-It creates a "tax wedge" (difference between consumer and producer prices) as there is now a gap between the price that the consumer must pay and the price that the supplier receives

### Deadweight Loss

-*deadweight* losses stem from the fact that the tax results in a lower equilibrium level of output

- At the margin, consumers and suppliers both want more units to be produced but are prevented by the tax
- deadweight loss implies an efficiency loss
- The magnitude of deadweight loss depends on the elasticity's of both supply and demand
- *The government* gains from the tax revenue
- *The equilibrium price* increases, equilibrium Q decreases
- *The price that consumers pay* increases however price producers receive decreases because of the tax, both CS and PS to decrease

-This causes both consumer surplus and producer surplus to fall

Another Example: "Labor market tax"

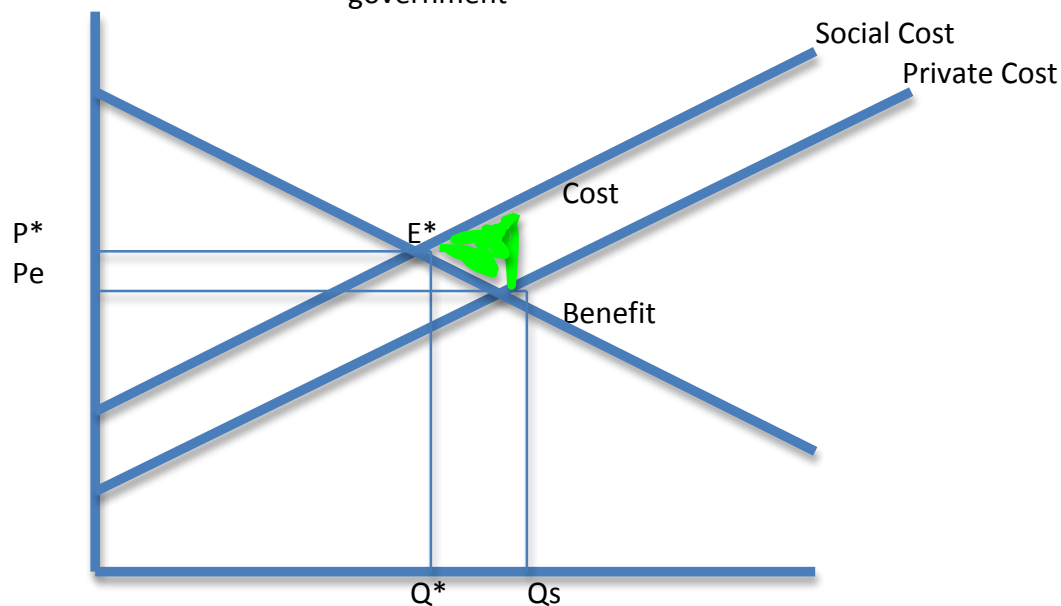
## 4. MARKET FAILURES-EXTERNALITIES

-Externalities refers to a cost/benefit affecting parties other than those involved in the activity

### a. Negative Externalities

It is a side effect that impacts outside parties

- Eg. Pollutants adversely affect the health of the population or damage the environment
  - The polluting firm faces only private costs as it decides how much output to produce
  - Society faces the social cost which include the private costs as well as the adverse effects
  - Social costs > private costs
  - The firm is thus over producing from a social point of view
- Eg. "Negative Externalities and Inefficiency"
  - A possible policy remedy is to impose a "corrective" tax on each unit produced such that the producer faces higher costs of producing and hence of polluting
    - The S curve for the firm shifts upwards causing the firm to lower its output level to  $Q^*$
    - By rendering the costs of pollution internal to the firms decision, the equilibrium becomes more efficient without direct controls from the government



Green Triangle: Loss of supply

-Private cost as  $(Q_e, P_e)$  but really should stop at  $(Q^*, P^*)$

-If government doesn't intervene, E will be at  $(Q_e, P_e)$  we want to be at  $E^*$  gov can shift private costs curve to social cost curve (taxes to increase cost for producers)

### b. Positive Externalities

-Externalities of the positive kind enable individuals or producers to get a type of “free” on the efforts of others

-Government intervention may be beneficial in the case of positive externalities

-The private benefits received by the producer differ from the social benefits received by society

- Examples
  - R and D “spill over effect” touch screen
  - Vaccine shot- Immunization

### Other Market Failures:

Besides externalities, there are other cases of market failure, which mean that the

- Monopolies
- International Externalities

## 5. CLIMATE CHANGE, THE ENVIRONMENT AND POLICY

- Greenhouse gases (GHG) cause global warming and can be viewed as a negative externality
- The Kyoto protocol stipulated that Canada would reduce its emissions of GHG to 6 % below 1990 levels
- Policies to reduce GHG emissions
  - Direct controls
  - Tax
  - S tax tradable permits to pollute
- The latter two rely on the market

Eg: “Environment Economics”

- In order to attain a target level of pollution at minimal resource cost, the marginal abatement cost of each firm should be the same

## 6. EQUITY, JUSTICE, and EFFICIENCY

- **horizontal equity:**
  - people who have the same income should pay the same tax
  - Rules out discrimination
- **vertical equity:**
  - Unequal treatment of individuals whose innate abilities, capacities and income are different
  - Implies that high income people should pay higher tax
  - A more normative concept
- Inter-generational equity
  - Involves a balancing of interests and well-being of different generations

Example...

- Canadian/Quebec Pension Plan
- Will today’s aged population benefit at the expense of today’s youth?

-There usually exists a tradeoff between equity and effectiveness because high taxes will create high dead weight loss

Example: Equity vs Efficiency

What to know?

- 1.calculate CS PS
- 2.how to shift the supply and demand curve

## Consumer Choices

## Chapter 6

Two ways of measuring  
Utility/Satisfaction/Happiness etc...preferences

**1. CARDINAL UTILITY AND ORDINAL UTILITY****a. Cardinal Utility:** (Quantative Utility)

- is a measure concept of satisfaction
- total utility is the total satisfaction from consumption derived from consuming all of the units over *a time period*
- Marginal utility is the additional, or increment to total utility created when a small increase of a good or service is consumed
  - $MU = \Delta TU / \Delta \text{consumption}$
- Marginal utility is diminishing (decreasing)
  - Each additional unit consumed yields less additional utility than the one consumed right before it

Example: "Snowboard trip and Jazz tickets"

Visit Numbers	Total Snowboard Utils	Total Jazz Utils	Marginal Snowboard Utils	Marginal Jazz Utils	Marginal Snowboard Utils per \$	Marginal Jazz Utils per \$
1	72	52	72	52	2.4	2.6
2	132	94	60	42	2.0	2.1
3	182	128	50	34	1.67	1.7
4	224	156	42	28	1.4	1.4
5	260	180	36	24	1.2	1.2
6	292	201	32	21	1.07	1.05
7	321	220	29	19	0.97	0.95

See "Total Utility" of Snowboard trip and Jazz tickets

See "Marginal Utility" of Snowboard trip and Jazz tickets

Snowboard Price= \$30

Jazz Price= \$20

Total Income= \$200

**2.4 is constant\*\***

1) Purchase 1 unit of Jazz= \$20

- Income= \$180 (200-20)
- Consumed: 1 unit of Jazz

2) Purchase 1 unit of snowboard One mountain trip= \$30

- Income= \$150

- 3) Purchase 1 unit of Jazz=\$20
  - Income= \$130
- 4) Purchase 1 unit of snowboard= \$30
  - Income= \$100
- 5) Purchase 1 unit of Jazz=\$20
  - Income= \$80
- 6) Purchase 1 unit of snowboard= \$30
  - Income= \$50
- 7) Purchase 1 unit of Jazz=\$20
  - Income= \$30
- 8) Purchase 1 unit of snowboard= \$30
  - Income= \$0

Continue until you reach 0...

- in the end this person maximizes their income by buying 4 snowboard trips and 4 jazz tickets
- In this example the budget is exhausted after purchasing 4 units of each
- A consumer equilibrium occurs
- In an exam he would give us the first 3 columns and we will have to find MU

2.4-2.6

2.4-2.1

1.67-2.1

1.67-1.4

- If this equality does not hold, then the consumer can increase TU by making switches

Mathematically Equilibrium Conditions,

$$\frac{MU_s}{P_s} = \frac{MU_j}{P_j} + \text{INCOME} = 0$$

Assume that there is "no saving"

Note that the consumer chooses the quantities based on

Think of this as the budget allocation rule

Assume that all income is spent -

## **2. UTILITY AND DEMAND**

One purpose of analyzing consumer choice is to derive the demand curve for an individual

Consider the equilibrium condition  $MU_s/P_s = MU_j/P_j$

- **a.** If the price of snowboarding increases what would happen? Quantity of snowboard decreases

- **b.** Equilibrium adjusts
  - **c.** Given the law of diminishing marginal utility, the new equilibrium (after  $P_s$  rise) can occur if the quantity of snowboard decreases
  - **d.** Hence an increase in price reduces the “quantity demanded” and we call this “law of demand”
- We started with an increase in the price of snowboarding, and ended with a decrease in the quantity demanded of snowboarding
  - This is the law of demand:
    - Holding: all the other factors constant
      - Eg. Price of Jazz, Income, preference
  - Illustration: repeat the optimal decision making process given the “new price” of snowboards and update the optimal consumption bundle, compare the new bundle with the original bundle

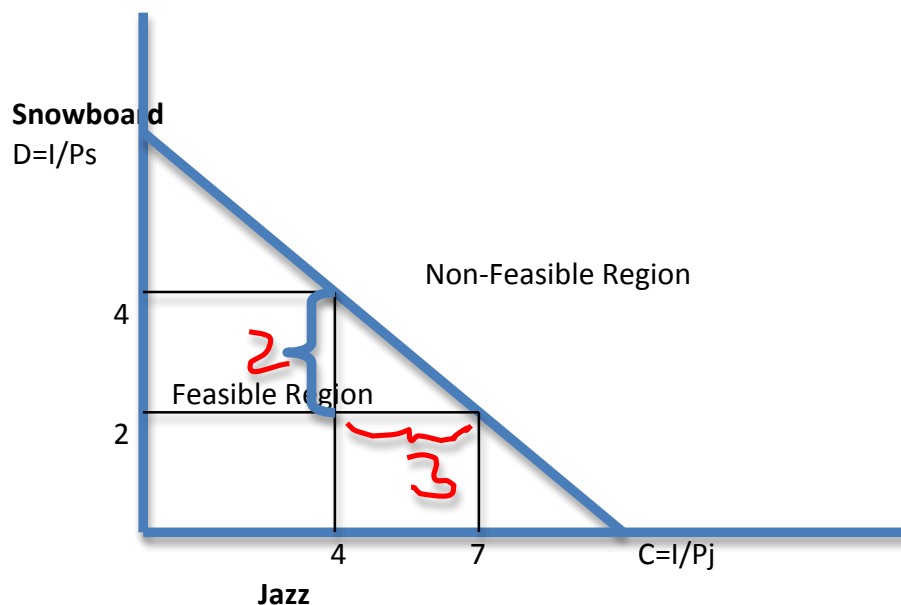
### 3. ORDINAL UTILITY APPROACH

-This approach to consumer choice involves a different assumption about utility

- We assume consumers can order bundles of goods in accordance with the satisfaction or utility bundles generate
- This is the concept of *ordinal utility*, as opposed to *cardinal utility*

-There are two elements to this analysis

- i) The budget constraint, which defines what is affordable or feasible
- ii) Indifference curves, which reflects preferences or tastes



$$P_s S + P_j J = I$$

Points

$$30 + 20 = 200$$

Slope

$$(I/P_s) / (I/P_j)$$

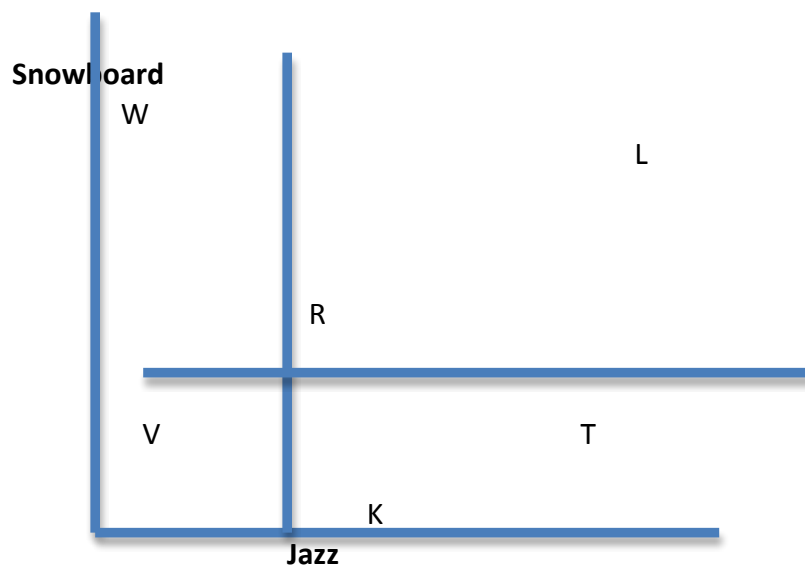
$$P_j/P_s$$

$$= -2/3$$

See "Budget Constraint"

- Indifference analysis is the counterpart for the consumption schedules that were employed for the cardinal utility approach
  - The *TU* and *MU* variables
- Assume that consumers prefer more to less
- The tastes can be represented graphically by an indifference map
  
- In the graph to follow, the axes are the same as they are for the graph of the budget line
  - Consumption of snowboarding on the vertical axis
  - Consumption of jazz is on the horizontal axis
- The figure examines the consumer's ranking of bundles of the two goods

See "Taste 1"



Region L is preferred to region R

L: Higher satisfaction

R: in between v satisfaction and L satisfaction

T: a lot of jazz limited snowboarding

W: a lot of snowboarding limited jazz

### Indifference Curves

- An *indifference curve* defines combinations of goods that yield the same level of satisfaction to the consumer
  - She is indifferent between all bundles on a given curve
- An *indifference map* is a set of indifference curves where curves further from the origin denote a higher level of satisfaction

(Graph in book) Marginal rate of substitution

-moving from n to h you have to sacrifice amount of snowboards

-the more you have for one good the more you have to pay for the other

-Depicts the consumer's tastes

### Properties:

- Curves further from the origin reflect higher utility
  - more is preferred to less
- **\*\*Always Negative slope**, Slope = marginal rate of substitution (MRS) We call each slope MRS
  - Less of one good requires more of the other to maintain a given level of satisfaction
- Indifference curves cannot intersect all parallel
- Convex shape

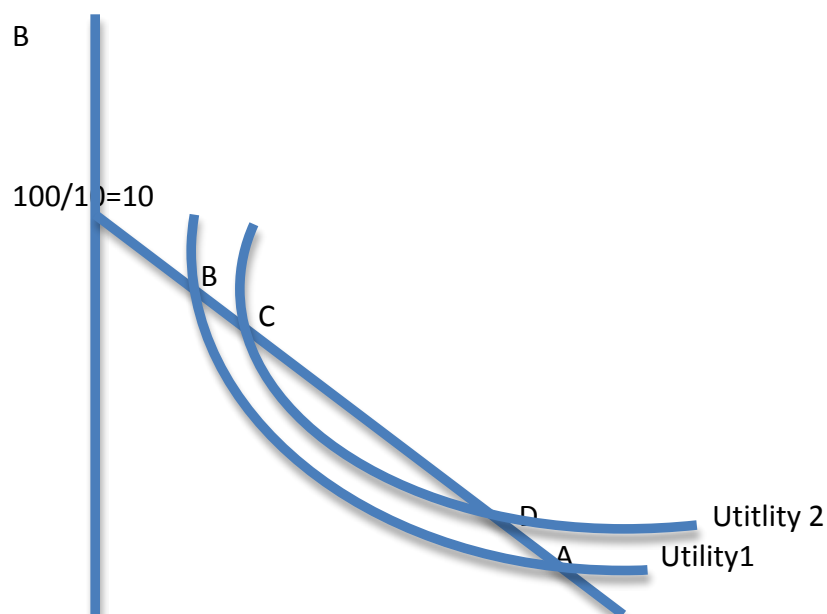
-Become flatter as one moves from L to R

-Due to the law of diminishing marginal utility,

-Conversely, MU is high when consumption levels are low

### To optimize:

- The consumer's choice is determined by the point of tangency between the height line and the indifference curve

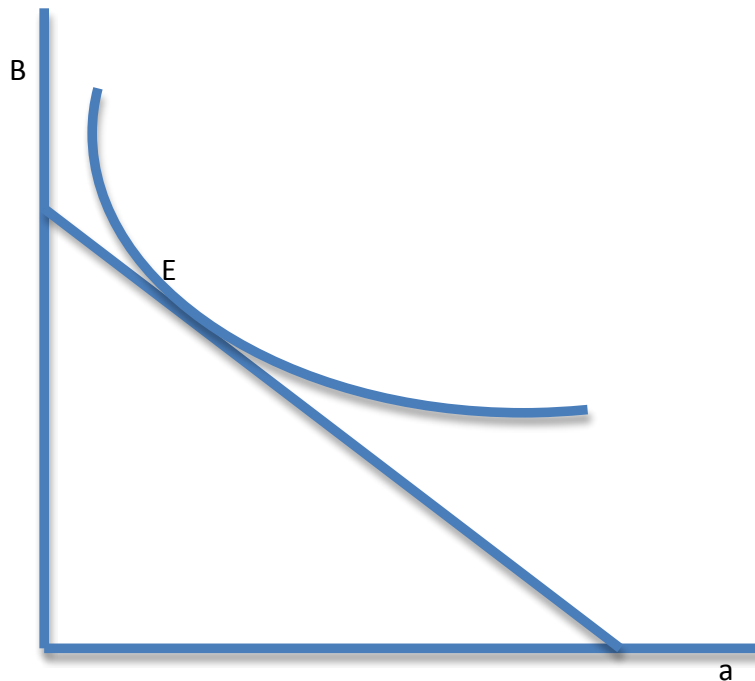


$100/20=20$  a

Pc=5  
 Pb=10  
 Income=100  
 You go until utility 4 until you reach equilibrium (optimal)

Common features:

**1. Cardinal Approach:**  $\frac{MU_a}{\text{Price a}} = \frac{MU_b}{\text{Price b}}$



Slope of E =  $\frac{(\text{Income} / P_b)}{(\text{Income} / P_a)}$   
 =  $P_a / P_b$

**2. Ordinal Approach:**  $MRS = \frac{A+E}{P_b} = \frac{P_a}{P_b}$

This gives the highest possible indifference curve,  
 This occurs at the point where  
 Mathematically,  
 See "Utility Optimum"

**Income Shock:**

- If income rises and the prices remain the same, the budget line shifts outward in a parallel fashion
  - The consumer can afford more of both goods
  - He will reach a higher indifference curve, and hence a higher level of satisfaction

-See "Income Shock" (In book)

**Price Shock:**

- If the price of jazz rises, the budget line rotates inwards, but the Y-intercept does not change
  - The budget line becomes steeper
  - He will reach a lower indifference curve, hence a lower level of satisfaction
- The quantity of jazz consumed will fall

-See "Price Shock" (In Book)

# Firms, Investors and Capital Markets

## Chapter 7

### 1. SOME TERMS

- **Sole Proprietor:**
  - The single owner of a business
- **Partnership:**
  - A business owned jointly by 2 or more individuals showing the profits and jointly responsible for any losses
- **Company:**
  - An organization legally allowed to trade and produce and having limited liability
- **Shareholder:**
  - Individuals who invest in companies and therefore are the owners
- **Dividends:**
  - Payments made from after-tax profits to the shareholders
  - **Capital Gains:**
    - Income resulting in selling shares at a price higher than original purchase price
    - Buying stock at a low price and selling it at a high price is the capital gain
  - **Limited Liability:**
    - The liability of the company is limited to the value of the company's assets
  - **Retained Earnings:**
    - Profits retained by a firm for reinvestment and not distributed in dividends

#### Firm:

- Use capital labor and human expertise to produce a good to supply a service or to act as an intermediary
  - To seek to earn a max profit
- Businesses required to produce annual income statement that accurately describes the operation of the company

-See Bank of Montréal example

- Economists believe that profit maximization accurately describes a typical firm's objective
- Corporate goals sometime deviate from profit maximization
  - **Principal-agent relationship**
    - Management (agent) different from ownership (principal)
  - **Principal-agent problem**
    - If the principal cannot easily monitor the actions of the agent, the agent may not always act in the best interests of the principal

### 2. RISK AND THE INVESTOR KEY TERMS:

**Example 1:**

A coin toss game yielding \$0 to a participant on 'heads' and \$10 on 'tails' that has a fee for play of \$5 is fair.

$$(0.5 * \$0 + 0.5 * \$10 = \$5)$$

**Example 2:**

A fire insurance policy costing \$1,000 to insure a \$100,000 home is fair if the house may burn down one time in a hundred

$$(0.01 * 100,000 + 0.99 * \$0 = \$1,000)$$

**Example 3:**

If the Casino in Las Vegas pays out \$0.95 for ever \$1.00 bet, the casino is not offering fair odds.

**Gambles**

- Fair gamble
  - On average the return is zero
  - Ex. Lose \$10 with 50% probability, win \$10 with 50% probability
    - Average return =  $(.5)(-10) + (.5)(10) = 0$
- Favorable gamble
  - On average return is positive
  - Ex. Lose \$10 with 50% probability, win \$20 with 50% probability
    - Average return =  $(.5)(-10) + (.5)(20) = -5 + 10 = \$5$
- Unfavorable gamble
  - On average return is negative
  - Ex. Lose \$20 with 50% probability, win \$10 with 50% probability
    - Average return =  $(.5)(10) + (.5)(-20) = -10 + 5 = -\$5$

**Risk averse person**

- Prefers to avoid risk, but may choose to bet or gamble if the odds are sufficiently in their favour, despite their inherent dislike of risk
  - Dislike taking risks
  - Will never participate in fair gamble and may participate in favorable gamble, because they do not want to take risks and lose

**Risk neutral person**

- Only interested in whether the odds yield a profit on average, and ignores the dispersion in possible outcomes
  - Not in fair gamble
  - Willing to participate in any favorable gamble
  - Will participate so long as the return is positive

**Insurance**

-Opposite of gambling

- Reduces risk for us
- Ex. 1% probability of damage to the home, 99% not

- $(.01)(250,00) + (.99)(0) = \$2500$
- Premium = \$2500
- They charge = \$3000 or \$4000

### Risk pooling

- Aggregates independent risks to make the aggregate less uncertain and thereby increases average utility

### Risk spreading

- Works by reducing the stake of each participant

→ See "Risk Pooling"

- Since investing in an enterprise is a risky business, and most investors dislike assuming too much risk, financial markets provide risk pooling and risk spreading as a way of channeling saving to investment

→ See "Utility from Extremes and Utility from Averages"

→ See "Risk Spreading"

### Asset Returns:

- The real return
  - is the nominal return minus the rate of inflation
- Real return to investing in a company share
  - is the sum of the dividend and the capital gain or loss, adjusted for the rate of inflation

### 3. FINANCING THE RISKY FIRM THROUGH DIVERSIFICATION

- The *capital market* is the set of financial institutions that funnels financing from investors into bonds and stocks
- A *portfolio* is a combination of assets that is designed to secure an income from investing and to reduce risk
- *Diversification* reduces the total risk of a portfolio by pooling risks across several different assets
  - Total degree of risk is measure by the variance

→ See "Diversification"

### Variance:

- The variance is a measure of how dispersed the outcomes are – how far the outcomes are from the average outcome
  - It is a weighted sum of the squared deviations from the mean

#### Strategy 1:

Since each outcome has an equal probability the weights are 0.5

$$\text{Variance} = 0.5 * (220 - 210)^2 + 0.5 * (200 - 210)^2 = 100$$

#### Strategy 2:

Yields the same result as strategy 1

Strategy 3:

Since each outcome has a different probability the weights are 0.25 and 0.5 respectively

$$\text{Variance} = 0.25 * (220 - 210)^2 + 0.5 * (210 - 210)^2 + 0.25 * (200 - 210)^2 = 50$$

- It is better to hold also government bonds since because of the group risk...

See "Stock Prices"

# Production and Costs

## Chapter 8

### 1. EFFICIENT PRODUCTION

- a *production function* is a technological relationship that specifies how much output can be produced with specific amounts of input
- *technological efficiency* means that the maximum output is produced with the given set of inputs
- An *economically efficient* production structure is the one that produces output at least cost

### 2. SHORT-RUN VS. LONG-RUN

- *Short Run*
  - At least one factor is fixed
- *Long Run*
  - All factors of production- adjustments have time to be made
- *Very Long Run*
  - New technology appears A increase

### 3. PRODUCTION IN THE SHORT RUN

- **Total product (TP)**
  - is the relationship between total output (Q) and the number of workers (L) employed holding k fixed
    - $Q=f(L)$
- **Marginal product (MP)**
  - is the addition to outputs produced by each additional worker
    - $MP = \text{Change in } q / \text{Change in } L$
- **Average Product (AP)**
  - is the relationship between output and the number of workers employed
    - $AP = Q/L$

Example: "Snowboard Production, Productivity"

=

No. of Workers	Output (TP)	MP= change in Q/ change in L	AP=change in Q/ change in L
0	0		
1	15	15	15
2	40	25	20
3	70	30	23.3
4	110	40	27.5
5	145	35	29
6	175	30	29.2
7	200	25	28.6
8	220	20	27.5
9	235	15	26.1

10	240	5	24
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“Total product curve” + “MP and AP curve”

#### 4. COSTS IN THE SHORT RUN

##### Fixed costs (FC)

- Costs that are independent of the level of output
- Can be thought of as overhead costs or research and development
- Average fixed cost (AFC)
  - $AFC = FC/Q$

##### Variable costs (VC)

- Costs that are directly related to the output produced
- e.g. Labor costs, material costs
- Average variable cost (AVC)
  - $AVC = VC/Q$

##### Total costs (TC)

- Sum of fixed costs and variable costs
- Average Total Cost (ATC) is TC per unit of output
  - $ATC = TC/Q$

##### Marginal cost (MC)

- The cost of producing each additional unit of output
- $MC = \Delta TC / \Delta Q$
- Also  $MC = \Delta TC / \Delta Q$  because fixed costs are fixed

Example: “Snowboard Production Costs”

“Total Cost curve” + “Average cost and marginal cost”

- We observe that  $MP$  intersects  $AP$  at max  $AP$  and  $MC$  intersects  $ATV$  and  $AVC$  at their minima
  - Is there a relationship?

-When productivity is at its highest costs are least

-The  $MC$  is the ‘flipside’ of  $MP$ ; the  $AVC$  is the ‘flipside’ of  $AP$

- **The Average Relationship**

- $AVC = \text{Total Variable Cost}/Q = \text{wage bill}/Q$
- $= W \times L / Q = W \times 1/APL$
- Hence,  $AVC$  varies inversely with  $APL$

When  $AP_L$  is highest,  $AVC$  is lowest

- **The Marginal Relationship**

- $MC = \Delta TVC / \Delta Q = \Delta \text{wage bill} / \Delta Q$
- $= W \times \Delta L / \Delta Q = W / MPL$ 
  - $MC \downarrow$  when  $MP \uparrow$ ;  $MC \uparrow$  when  $MP \downarrow$
  - $MC$  reaches a minimum when  $MP$  is a maximum

- MC curve slopes upward over most of its range due to law of diminishing marginal returns

**Shut-down Point:**

- If the firm cannot make a profit, should it shut down?
- If it can cover its variable costs, having already sunk its fixed costs, it should stay in production
  - A sunk cost is a fixed cost that cannot be recovered, even via a shutdown

## 5. LONG-RUN PRODUCTION AND COSTS

- Long-run all factors are variable
- The scale of output refers to the level of production given that the capital stock can be increased or decreased to fit the expectations for sales in the long run

**Increasing returns to scale**

- When all inputs are increased by a given proportion, output increases more than proportionately

**Constant returns to scale**

- Output increases in direct proportion to an equal proportionate increases in all inputs

**Decreasing returns to scale**

- An equal proportionate increase in all inputs leads to a less than proportionate increase in output

**Minimum efficient scale**

- A threshold size (operating level) such that no further economies of scale can be realized

Example “Long-run and short-run Cost curves”

- Returns to Scale: Increasing if proportionate change in all inputs yields more than proportionate increase in output
  - Perhaps through better workflow following expansion
- If the prices of  $K$  and  $L$  are fixed then *IRS* results in a declining *LMC*; *CRS* implies constant *LMC* and *DRS* implies increasing *LMC* in the long run
  - *Example*
  - A phase of linearly declining MC followed by constant MC followed by linearly increasing MC
  - Note that returns to scale are defined in terms of *changes* and therefore are initially related to *marginal costs* in the long run

Example “Returns to Scale and LR Cost”

- Technological Change and Globalization
  - Reduce costs and increase the point of minimum efficient scale
- Clusters and Externalities

- Groups of like firms or workers exchanging information and ideas e.g. Silicon Valley
- Learning by Doing
  - Costs decline over time due to learning: incumbents have a cost advantage
- Economics of Scope
  - Multiproduct supply may be less costly than single product supply

# Perfect Competitive Market

## Chapter 9

### 1. PERFECT COMPETITIVE MARKET

- a *perfectly competitive industry* is one in which MANY producers, producing identical products face many buyers, no one participant can affect the market price
- *Firms* maximize profit (profit will be the difference between revenue and cost)
- *Free* entry and exit of firms → Is critical
- Buyers and sellers share full information profit information

#### Feature of a Perfectly Competitive Market

- An important implication is that no one firm can have an input on market price by altering its own price on its own output level
  - Consumers and firms are price takers
  - As a result not assumption
  - In other words, the firm can sell as little or as much output as it could possibly produce at the going market price
- Graphically it means that the demand curve facing the individual firm is horizontal at the market price
  - Note that in perfectly competitive markets, there are two demand curves
    - One facing the individual firm
- One facing the whole market
- The firm's demand curve is infinitely elastic (perfectly elastic)

→ See "The Competitive Firm's Optimal Output"

### 2. FIRMS DECISION

- Marginal revenue (MR) is the additional revenue obtained by the firm selling one more output
  - It's the change in total revenue (TR) resulting from a unit increase in output
  - $MR = \text{change in TR} / \text{change in Q} = P$  (only in perfectly competitive market)
- If the firm cannot make a profit, should it shut down?
- If  $P > AVC$ , it can cover its variable cost having already sunk its fixed cost it should stay in production even if it cannot cover all of its costs
- If it can cover its variable costs, having already sunk its fixed costs, it should stay in production. Hence its supply curve is that part of MC above AVC

→ See "Short-Run Supply for the Competitive Firm"

→ See "Profit Maximization"

Industry Supply in the Short-run

Sum of individual firm's supply

See "Industry Supply and Equilibrium in the Short Run"

### 3. IN THE LONG RUN

Industry Dynamics: Entry and Exit of Firms

- **Normal Profits**
  - Reflect the opportunity cost of production

- Firms do not operate in the long run if they cannot make normal profits
- **Supernormal/Economic Profits**
  - Profits above normal profits that induce firms to enter an industry. Implies  $P > ATC$
- **Long-run equilibrium**
  - $P = \text{minimum } ATC$

→See “Long-Run Dynamics”

#### Short-run and Long-run Dynamics:

- Market supply expands, price declines and profits are reduced
- When economic profits are fully competed away, there is no incentive for further entry
- In this case positive economic profits induce entry to the industry
- Thus, in the long-run, perfect competition ensures that economic profits are zero – normal profits

#### 4. LONG RUN-INDUSTRY SUPPLY

-The LR industry supply is horizontal at the price corresponding to the minimum of a typical firm's LR average cost curve

Why?

- Free entry ensures that LR economic profits will be zero
- If some firms produce at a low cost and others at a higher cost, the latter will not survive in the long run
- Those suppliers choosing the least cost production will survive the competition
- This least cost method involves producing at a point where the AC is minimal in the long run – i.e. the min of the LRAC
- With zero economic profits this least cost must also be the price

→See “Long-Run Industry Supply”

→See “Increasing Decreasing Costs Industries”

#### Globalization and Technological Change:

- The reduction in costs associated with globalization has effectively increased the *minimum efficient scale* for many industries

#### Efficient Resource Allocation and Perfect Competition

- Perfect Competition is frequently an efficient market structure
  - It results in resources being used up to the point where the demand and supply values are equal
  - If it is efficient it maximizes the sum of consumer and producer surpluses – chapter 5

# Monopoly

## Chapter 10

### 1. WHERE DOES THE MONOPOLY COME FROM?

- A *natural monopoly* is one where the AC of producing any output declines with the scale of operation.
  - Increasing returns to scale, even at very high output levels
- *National Policy*: a deliberate government policy to protect a domestic monopoly
  - E.g. a “national” carrier in the airline industry Air Canada
- Maintaining *barriers to entry*
  - Patents, granted by government
  - Predatory pricing, intended to drive out potential competition
  - Lobbying government for subsidies as a means of preventing entry (Bombardier?)

Examples: Computer Operating Systems *Microsoft* Linux IOS?

See “Natural Monopoly”

### 2. PROFIT MAXIMIZING BEHAVIOUR

- Marginal revenue =  $MR$  = Change in total revenue obtained by selling on more unit
- Total revenue =  $TR = P \cdot Q$
- Average revenue = revenue per unit sold =  $P$
- Marginal cost =  $MC$  = change in total cost obtained by producing one more unit
- Profit = total revenue – total cost =  $TR - TC$

See “The Profit-Maximizing Monopolist”

To find the Max of TR:

MR is about to turn zero at the max of TR.

See “Total Revenue Schedule”

### 3. THE OPTIMAL OUTPUT

- Profit maximization rule:
  - If  $MR > MC$ , increase output
  - If  $MR < MC$ , reduce output
  - If  $MR = MC$ , output is optimal
- Example
  - Demand:  $P = 16 - 2Q$
  - Marginal Cost:  $MC = 1 + 1Q$
  - Marginal revenue:  $MR = 16 - 4Q$  (Slope is twice the D curve)
  - $MR = MC$ :  $16 - 4Q = 1 + 1Q$  implies  $Q = 3$

$$P = 16 - 2 \times 3 = 10$$

See “Demand, Marginal Revenue and Total Revenue”

See “The Monopoly Equilibrium: Profit Calculation”

See “The Missing Supply Curve”

See “The Monopolist Long Run”

### 4. IS MONOPOLY EFFICIENT

- Objective: to compare the output produced by monopolist with the efficient output – produced in perfect competition
  - Recall under perfect competition that marginal value at the equilibrium =  $MC$
  - Marginal value is the price, hence in perfect competition price =  $MC$
  - We will illustrate this assuming that the monopolist experiences CRS

See “Monopoly Output Inefficiency”

## 5. PRICE DISCRIMINATION

- *Price discrimination* involves charging different prices to different consumers in order to increase profit
- Conditions for price discrimination
  - The seller must be able to screen or segregate the market into those willing to pay more and those willing to pay less
  - Resale must be impossible or impractical
- Price discrimination may actually reduce the deadweight loss in the case of monopoly.

See “Profit Maximization through Price Discrimination”

See “Price Discrimination”

## 6. CARTEL

- A *cartel* is a group of producers who co-operatively reduce output with the aim of increasing profits
- It behaves like a monopolist
- Cartel instability
  - Cartels can break down as member firms usually have an incentive to expand output (against the agreement), resulting in a lower market price
- Cartels within individual economies are almost universally illegal

See “Cartelizing a Competitive Industry”

Rent-Seeking Behavior: protect monopoly status

- *Rent seeking* is an activity that uses productive resources to redistribute rather than create output and value
  - Lobbying the government to reduce competition
- Rent seeking has a resource cost
  - The work of lobbyists does not result in more output
- Who pays for rent seeking?
  - It gets incorporated into the cost structure of firms who have a degree of market power

See “Rent Seeking and Costs”

## 7. MONOPOLY, TECHNOLOGY AND INNOVATION

- Invention is the introduction/discovery of a new product or process through research
- Do monopolies have a greater tendency to invent and innovate?
  - Monopolists say yes, but empirical evidence does not support this claim
- Patent laws: designed to foster innovation by granting monopoly production rights for a period of 10-15 years

# Imperfect Competition

## Chapter 11

### 1. IMPERFECT COMPETITION

- An **imperfectly competitive firm** faces a downward-sloping demand curve, and its output price reflects the quantity it sells
  - Imperfect Competition is a general name incorporating several distinct structures
- An **oligopoly** is an industry with few producers, each recognizing its interdependence
- An industry with **monopolistic competition** has many sellers of products that are close substitutes for one another. Each firm has only a limited ability to affect its output price

See “Market Structure”

- The key factor is the size of the market (the amount of demand) relative to the cost structure in the industry
  - If many firms can produce at a cost efficient scale, the market is likely to be competitive
  - If one or only a few firms can produce at a cost-efficient scale, the market is not likely to be competitive

That cost-efficient scale called *minimum efficient scale*

See “Market Structures Differ”

- Evidence on Market Structure
  - *Concentration ratio* is a measure that is frequently used to gauge market power
    - What % of the market is served by the  $N$  largest firms?
    - High ratio denotes imperfect competition
    - Low ratio denotes a higher degree of competition
- Globalization and Multinationals
  - The concentration ratio means less in this context
  - Further economies of scale might be possible than if the firm were purely domestic

See “Evidence on Market Structure”

### 2. MONOPOLISTIC COMPETITION

- Downward-sloping demand curve
- Many suppliers of a differentiated product
  - Contrast to perfect competition
- Limited opportunity to exploit scale economies
- Profit is maximized when  $MR = MC$
- Free entry implies no supernormal profits exist in the long run

Examples: local restaurant, corner store

- Consider a situation in which a firm is earning profits
- This induces entry into the industry, which shifts the D curves for the existing firms to the left

- Entry will end when  $profits = 0$
- This occurs at an output level where  $P = ATC$
- $MR = MC$  always

See “The Firm Equilibrium”

### 3. OLIGOPOLY

- With a small number of firms each must consider how its actions affect the decisions of its competitors
  - *Collusion* is where firms attempt to form a cartel in order to act like a monopolist
  - This is also known as the *cooperative outcome*
  - A *conjecture* is a belief regarding how other firms will react to a strategy or a decision
    - E.g. if I lower my price will my competitors follow?
- Firms recognize their *interdependence* and are thus perhaps involved in a type of ‘game’ – particularly if there are very few competitors
  - The players are the firms, and they *adopt strategies* which they hope will maximize their profit
  - What price or quantity decision should they make?
  - What advertising decisions should they make, if any?
  - A *Nash equilibrium* is attained when each firm chooses the best strategy given the strategies of the other firms
  - A *dominant strategy* is one that is best regardless of the particular strategy chosen by an opponent or rival
  - Games are frequently illustrated using a *payoff matrix*, which defines the outcomes in the various scenarios

See “Prisoners’ Dilemma”

### 4. DUOPOLY- A COURNOT GAME

- The *duopoly model* has two firms who make optimal quantity choices, given the choice made by the other firm
- Named after the economist *Cournot*, who first analyzed the problem
- To determine *A*’s strategy, suppose *B* decides to supply some quantity, say  $q_{B1}$
- *A* takes this as a given, figures out her demand curve and maximizes profit by choosing an output where  $MC = MR$

See “Duopoly and Cournot Games”

Reaction Functions

See “Reaction Functions”

- This equilibrium is not collusive (or cooperative), and thus it is not the monopoly equilibrium
- Joint output is higher, and price is lower, than the case of a cooperative game with a successful cartel
- Less is produced than in perfect competition

## 5. ENTRY AND POTENTIAL COMPETITION

- Free entry and exit and the role of the global firm
  - A contestable market has potential entry and competition. e.g. airlines/flights
  - Free exit means a firm can recover its up-front/fixed costs
- A *strategic entry barrier* might involve constructing additional, unused capacity in order to deter entry
- Conclusion: The reality of our many different market structures is complex

# International Trade

## Chapter 15

### **1. CANADIAN INTERATIONAL TRADE**

See "Canada Trade"

- Agricultural Protection
  - Protects developed economy farmers, hurts farmers from LDCs
- Globalization: Outsourcing of manufactures to LDCs
  - Has the West lost good jobs?
- Trade or Aid
  - Do trade barriers offset aid to LDCs?
- Expansion of the European Union
- North American Free Trade

### **2. COMPARATIVE ADVANTAGE**

- The Law of Comparative Advantage
  - Countries specialize in the production and export of products they produce at lower *relative cost* than other countries.
- The Law of Absolute Advantage
  - If one economy uses *fewer inputs* than another economy to produce a good or service, then that economy has an absolute advantage in its production.

See "Comparative Advantage"

- Exchange Rate:
  - Exchange rate is  $\$1\text{CDN} = \$1\text{U.S.}$

Canadians have an incentive to purchase both goods from the United States.

Exchange rate is  $\$1\text{CDN} = \$0.80\text{U.S.}$

Canada exports plywood and imports solar panels.

Exchange rate is  $\$1\text{CDN} = \$0.60\text{U.S.}$

Canadians have an incentive to export both goods from the United States.

Does Everyone Gain from Trade?

- Freer trade benefits the consumer, but some producing sectors lose out
  - Example: Clothing manufacturers in the West have lost out as the consumer has gained through cheaper manufacture in Asia (cheaper labor)

### **3. ECONOMICS OF PROTECTIONISM**

- *Tariff* – a type of tax
- *Quota* – a physical limit on imports
- *Non-tariff barrier* – standards designed to make sales difficult for overseas manufacturer
- *Subsidies and loans* – used by aircraft manufacturers in many economies

See "Tariff"

See "Subsidy"

See "Quota"

