

ECON 101 Notes, Winter 2015. Final mark: 95%. Easiness: 9.5/10. Interest: 6/10.

Professor: Dr. Cory Van De Waal

By: Jacky Zhai

Check out more of my notes at [www.jackyzhai.ca](http://www.jackyzhai.ca)

### What is economics?

- All economic questions arise because we want more than we can get (we don't have as much as we want).
- Our inability to satisfy all our wants is called **Scarcity**
- Because we have scarcity, we have to face **choices** (can only have some things)
- These choices depend on **incentives**- a reward that encourages action, or a penalty that discourages action
- **Microeconomics**- the study of choices individuals and businesses make, the way these choices interact in markets, and the influence of government on this.
- **Macroeconomics**- the study of the performance of the national and global economies

### Two big economic questions

- How do choices end up determining **what, how, and for whom** goods and services are produced?
- When do choices made in the pursuit of **self-interest** also promote the **social interest**?

### How are things produced?

- Goods and services are produced using productive resources that economists call **factors of production**. **Goods**- physical objects. **Services**- tasks performed for people.
- **Land** – this is given to us by nature, vital resource for agriculture. This is used to produce goods and services. Also called **natural resources** (oil, gas, coal, fish, water, air)
- **Labor** – The work time and effort that people devote to producing goods and services is labour. **Human capital** is the knowledge and skill people can obtain ( school, work experience). The **quality** of labor depends in human capital.
- **Capital**- capital is the tools required i.e machines for farming, production lines (money – or financial capital cannot produce goods, and **is not a factor of production**)
- **Entrepreneurship**- The human resource that organizes land, labour, and capital is entrepreneurship

### Who gets these goods?

- Land earns **rent**
- labour earns **wages** (part-time job) – labor earns the most, at **70%**
- capital earns **interest**
- Entrepreneurship earns **profit**
- The distribution of income is unequal, 20% lowest= 5 % total. 20% highest= 50% total

### Questions

- Self-interest. We make the choices that you think are best for you I.e ordering food because one is hungry.
- Social interest- choices that are best for society as a whole.
  - Efficiency- they must be efficient (lowest possible price, in quantities that give the best benefit) for society OR
  - Equity- they could be fair towards society. (fair distribution of goods)

### Globalization

- Expansion of trade, lending, and investment between countries
- Is in the self-interest of consumers as they can buy
- Also in the self-interest of big companies looking to profit

### Information Age Economy

- The information revolution has changed technology greatly
- Served in our self-interest: cell phones, electronics, internet
- Serves the self-interest of wealthy producers

### Climate Change

- Climate change is a result of self-interest: the convenience of cars, electricity, etc.
- We leave a carbon footprint, which could be lowered through walking/biking
- We could make decisions that affect the social interest

### Instability

- Between 1993 and 2007, Canadian and global economies expanded strongly, but in 2007, there was instability. Does this lending and borrowing serve the social interest?

### The economic way of thinking

- A choice is a **tradeoff** – scarcity implies choice. (will you choose to study or have fun)? (time is scarce)
- People make **rational choices** by comparing benefits and costs. Then, they pick the one that gives the best benefit. It would depend on the wants of a person
- **Benefit** is what you gain from something- determined by **preferences**- what you like and dislike
- **cost is** what you must give up to get something. The **opportunity cost** is something of the highest valued alternative that must be given up to get it. I.e going to school makes it so you can't earn money/cant afford some stuff.
- Most choices are "how-much" choices made at the **margin**. The increase in benefit that arises from an increase in an activity is the **marginal benefit**. (Studying one more night= perhaps increased grade).
- **Marginal cost**- the opportunity cost of an increase in activity (studying one more night= less fun time)
- Choices respond to **incentives**. A change in marginal cost or benefit changes the incentives and our choices. We can predict how choices change by looking at changes in incentives. Key to reconciling self-interest and social interest

## Economy as a social science

- What is- **positive statements** – checks facts
- What ought to be- **normative statements**- opinion/ cannot be tested

## Unscrambling Cause and Effect

- Economists only interested in positive statements on cause and effect. The task of economic science is to discover positive statements that are consistent with what we observe.
- To test this, we create **economic models** – a description of some aspect of economic world, only including features needed for purpose at hand
- A model is tested by comparing predicts vs facts. This is difficult, so we can use
- Natural, statistical (most popular), and economic experiments

## Economics as policy Adviser

- Useful for advising businesses and government
- Advice can be provided via normative and positive to solve policy questions
- They cannot help with the normative part- the goal
- But for a given goal, economics provides a method of evaluating alternative solutions- comparing marginal benefit vs cost.

## Lecture 2 – The economic problem

- Why does food cost way more today than a few years ago? Perhaps we use our corn crop to produce biofuels. Perhaps droughts have lowered the supply of food?
- We can use an economic model- the production possibilities frontier- to learn why these things increase price of food. Can also use the PPF to study how we can expand our production possibilities

## PPF- production possibility frontier

- Boundary between obtainable and unobtainable. Given a curve, **anything on inside is obtainable, outside unobtainable.** The boundary is where we should be. Anything inside the boundary would be inefficient, and no tradeoff is required to obtain it.
- In this model economy, everything remains the same (ceteris paribus), except the 2 goods we are considering.
- Every choice along the PPF involves some kind of tradeoff (i.e having to give up cola to make more pizza)
- This is the **opportunity cost** of the ppf. How much soda to give up to make one more pizza?
- Because resources are not equally productive in all activities, the PPF bows outward
- As the quantity of a good increases, so does the opportunity cost (pizza becomes more scarce, soda plenty)
- To determine alternative efficient quantities to produce, we compare costs and benefits

## Marginal cost

- The opportunity cost of producing 1 more of something else
- Marginal cost is increasing at a constant rate.
- **Preferences** are a description of a persons likes and dislikes

- To describe benefits, economists use the concepts of marginal benefits and the marginal benefit curve.
- i.e first coffee of day= large marginal benefit.. second less..third more less
- We measure **marginal benefit** by how much someone is willing to pay
- More of a good= smaller marginal benefit and the less we will be willing to pay for it. this is **the principle of decreasing marginal benefit**.

#### Allocative efficiency

- Since we cannot produce more of any one good without giving some other good, we have achieved **production efficiency**.
- We are producing a point on the PPF
- When we cannot produce more of any one good without giving up some other good we value more highly, we have achieved **allocative efficiency**
- We are producing at the point of the ppf that we prefer above all points.
- When the marginal cost = marginal benefit = allocative efficiency
- We won't buy if marginal cost > marginal benefit

#### Economic growth

- Using PPF of capital goods vs consumption, we pick a midpoint, allowing us to gain much more capital while sacrificing less consumption = growth during the next period
- Two key factors influence economic growth:
- **Technological change**: development of new goods, and better ways to produce these goods (robot manufacturers, computers)
- **Capital accumulation** is the growth of capital resources, which includes **human capital**.
- Cost of economic growth tomorrow is the decrease in our consumption today (we need to allocate some consumption to research, capital accumulation, etc)
- Economic growth is not free.

#### Comparative advantage and absolute advantage

- **Comparative advantage** looks at opportunity cost- someone that can produce at a lower opportunity cost has a comparative advantage. (prof: 40 zelda games, 40 dishes. Other: 6 zelda games, 30 dishes, both in same time), other person should do dishes, as the opportunity cost of dishes is lower (only 1/5<sup>th</sup> Zelda task).
- **Absolute advantage**- the person is more productive than others.
- Absolute advantage involve comparing productivity while comparative advantage involves comparing opportunity costs.

#### Specialization and gains from trade

- If we **specialize** in our comparative advantage, then we can possibly gain from **trade, and** possibly move outwards from the **ppf**.
- To get gains from trade, we have to **coordinate** the choices of individuals
- To make coordination work, four complementary social institutions have involved over the centuries

- **Firms**- an economic unit that hires factors of production and organizes those factors to produce and sell goods and services.
- **Markets**- any arrangement that enables buyers and sellers to get information and do business with each other (i.e mall, internet)
- **Property rights**- are the social arrangements that govern ownership, use, and disposal of resources, goods, and services.
- **Money**- is any commodity or token that is generally acceptable as a means of payment.

#### Circular flows through markets

- Households provide land, labor, capital, entrepreneurship. Goes to factor markets- firms- goods markets, then back
- Money goes to goods markets, to firms, then to factor markets.

#### SUPPLY AND DEMAND

- A **competitive market** is a market that has many buyers and many sellers, and no buyer/seller could influence the price of the good.
- The **money price** of a good is the amount of money needed to buy it
- The **relative price** of a good is the ratio of its money price of the next best alternative goal- It is the **opportunity cost**
- Demand- we **want it, can afford it, and made a definite plan to buy it.**
- Wants are the unlimited desires or wishes people have for goods and services, demand reflects a decision about which wants to satisfy
- **Law of demand**- if everything else remains the same, the higher price of a good, the smaller quantity demanded. The lower the price of a good, the larger the quantity demanded.

#### Demand

- **Substitution effect**- when the relative price of a good or service rises, people seek substitutes, so **the quantity demanded decreases.**
- **Income effect**- when the price of a good or service rises relative to income, people cannot afford all the things they previously bought, so **quantity demanded decreases. Only for normal goods**
- Movement along the demand curve happens when the price changes, assuming everything else remains same.
- If price is same, but some influence happens, the curve may shift outward or inward.

#### Demand curves

- Rise in price- decrease quantity demanded. Fall in price- increase quantity demanded
- A demand curve is also a **willingness-to-pay** curve.
- Willingness to pay measures **marginal benefit.**

#### Change in demand

- The quantity of the good that people plan to buy changes, so there is a new demand curve

- When demand **increases**, the demand curve **shifts to the right**. Decrease- **leftward**.

#### Main factors in changing demand

- **Prices of related goods-** a **substitute** is a good that can be used in place of another good- **complement-** a good that is used in conjunction with another good. When the price of a substitute for an energy bar increases, or when the price of a complement of an energy bar falls, **the demand increases**
- **Expected future prices-** if we expect a price of a good to go up, the current demand would **increase**, and the demand curve shifts outward. If we expect a price to fall, demand **decreases**, and the curve shifts in
- **Income-** when income increases, consumers buy more of **most** goods, and the demand curve shifts outwards. A **normal good** is one for which demand increases as income increases. An **inferior good** is when your income goes up, and you buy less of it (demand decreases as income increases).
- **Expected future income-** if we expect income to go up, or credit is easily obtainable, **demand will increase**. **Demand will decrease**, if the opposite happens.
- **Population-** if population goes up, demand goes up for all goods, and vice versa
- **Preferences-** people with the same income have different demands if they have different preferences

#### Supply

- If a firm has **supply**, then it has resources and technology to produce it, can profit from producing it, made a definite plan to produce and sell the good.
- **Resources and technology** determine what is possible to produce, supply reflects a decision about what is feasible to produce
- **Quantity supplied-** a given supply at a given of time

#### The law of supply

- Everything else held constant, higher price= the greater quantity supplied
- Lower price of good- lower quantity supplied
- The law of supply results generally in the marginal cost to increase, as we increase the quantity produced
- Producers are willing to supply a good if they can minimally cover the marginal cost

#### Supply curve

- **Supply** refers to the entire relationship between the quantity supplied and price of good
- **Supply curve** can also be called the marginal cost curve, shows the relationship between quantity supplied of good, and the price of good
- **Quantity increase- marginal cost increases**
- **Lowest price** is the marginal cost

#### Change in supply

- Some factors change supplies, **shift right-** more supply at each price. **Shift left-** less supply at each price

- **Prices of factors of production** – if the capital/resources required to make a good increase, curve moves left, and right vice versa
- **Prices of related substitutes and complements**- if a price of a **substitute in production** falls, then the supply of a good increases (people who make the substitute would switch to the good), and vice versa. Goods are **complements in production** if they are made together. If the price of a complement goes up, the quantity of the original good **also goes up**, and vice versa.
- **Expected future prices**- **price expected to go up**: less supply today, as people want to hold back making supplies until price increases. **Goes down- vice versa**
- **Number of suppliers**- The larger the amount of supplies, greater supply of good. Increase of number of suppliers shifts the supply curve rightward and vice versa.
- **Technology** – advances in technology allows for more **efficient production** and **less production cost**, allowing for **increase in supply**, shifting the curve **right**.
- **State of nature** – national disaster may destroy production (i.e early frost in florida **reduces orange supply**)

### Market equilibrium

- **Equilibrium** = opposing forces of **supply and demand** balance each other. When the price balances the plans of supply and also demand
- **Equilibrium price** is the price at which the quantity demanded equals the quantity supplied
- **Equilibrium quantity** is the quantity bought and sold at the equilibrium price
- **Price** regulates buying and selling plans, price adjusts when the buying and selling plans do not match
- **When demand goes up**, then there would be **(more equilibrium quantity, more price) and vice versa**
- **Increase in supply**, then there would be a **surplus**, forcing a downward pressure on price (**more quantity, lower price**), and more of the good, and vice versa
- If demand and supply **both increase**, there is an increase in **equilibrium quantity**, but price is **uncertain** (unless we know their relative sizes), if demand shifts **more than** supply (increase in quantity, increase in price) if supply shifts **more than** demand (increase in quantity, decrease in price).
- If demand and supply **both decrease**, there is a decrease in equilibrium quantity, **price is uncertain**. (shift demand left more = lower price, shift supply left more= higher price)
- If demand **decrease and** supply **increase**, the equilibrium price **lowers**. (shift demand curve left more, **equilibrium quantity goes up**, goes down otherwise)
- Increase in **demand and decrease in supply**, **equilibrium price rises** (shift demand curve right more = **quantity** goes down, goes up otherwise).

### Elasticity

- Percentage change in quantity demanded, divided by percentage change in price. We express these changes as a percentage of the **average price** – the average of the initial and new price. We express change in quantity also as the average
- Measures sensitivity or responsiveness of our quantity demanded due to change in prices.
- **Inelastic demand** – a fairly steep demand curve (when if the price changes a lot, quantity demanded changes very little)

- **Elastic demand**- fairly flat demand curve (when price changes very little, quantity demanded changes a lot)
- Midterm 1- chapters 1, 1a,2,3,4.
- Equation=  $(\text{change in quantity demanded } x / \text{average quantity } x) / (\text{change in price } x / \text{average price } x)$
- $< -1$  elastic, between 0 and -1, inelastic, at -1= unit elastic
- Can also be shown as a positive number, but the elasticity of demand is negative, as the demand curve has a negative relationship. **Always put negative when using demand.**
- **Elasticity** is unit free, so a change in units of measurement of price/quantity leaves the elasticity value the same.
- The absolute value reveals how responsive the quantity change has been to a price change.
- If elasticity is -4, if price raises by 1%, we lose 4% of quantity demanded.
- **Perfectly inelastic demand**- demand always stays the same when price changes demand elasticity is 0 (vertical line demand curve). Example of goods: **insulin, rare paintings, heroin.**
- **Unit elastic demand**- the elasticity is 1 (change in quantity proportionally same as change in price)
- **Inelastic demand** – elasticity is less than 1 (change in quantity proportionally less than change in price)
- **Perfectly elastic demand** – price elasticity is infinite – horizontal line **demand curve**, perfectly elastic demand (if the percentage change of quantity demanded is infinitely large when the price barely/doesn't change)- i.e two drink machines offer same goods, but one charges higher- no one will buy.
- On a **linear demand curve**, the midpoint is **unit elastic**, prices above the midpoint is **elastic**, prices below the midpoint is **inelastic**.

#### Total revenue and elasticity

- The **total revenue** is price\* quantity.
- When price changes, total revenue changes. Price increases do not necessarily bring about revenue change
- If demand is **elastic**, 1% price decrease in price would increase quantity sold by more than 1%, so revenue increases. And **vice-versa**. (we should **decrease** prices)
- If demand is **unit elastic**, any increase/decrease in price would result in the same increase/decrease in revenue (do nothing)
- If demand is **inelastic**, **1% price increase** would decrease quantity by less than 1%, and **vice versa**. (we should **increase prices**)
- **Total revenue test**- estimating price of elasticity by observing change in total revenue (given all other circumstances are same):
  - If price cut **increases revenue, elastic and vice versa**
  - If price cut **decreases revenue, inelastic and vice versa**
  - If price cut/raise **does not change revenue, unit elastic**.

#### Expenditure and elasticity

- If demand is elastic, a 1% price cut = expenditure increases, as you buy more than 1% more of an item
- Inelastic – expenditure decreases from a 1% price cut, as you buy less than 1% more of an item

- Unit elastic- expenditure remains the same

#### Factors influencing the elasticity of demand

- Closeness of substitutes – many substitutes- more **elastic**. Few subs- **inelastic**. Example: food has no substitutes have **inelastic demand**. Luxuries are **elastic**.
- Proportion of income spent on goods – higher amount spent = **more elasticity**, lower amount = **less elastic** (makes sense as more you spent, the more you look for substitutes)
- Time elapsed since a price change (no time- inelastic, more time- elastic).

#### Cross elasticity of demand

- Measures responsiveness of demand for a good x to a change in price of another good y that is a **substitute or complement** =  $(\text{change in quantity } x / \text{average } x) / (\text{change price good } y / \text{average good } y)$
- $> 0$  = substitute. Price of good y goes up = quantity good x goes up (as people switch to buying the other good)
- $< 0$  = complement. Price of good y goes up = quantity good x goes down (people buy less of complement = less of the good also)
- $= 0$  unrelated goods i.e (**ice cream and haircuts**)

#### Income elasticity of demand

- Measures how quantity demanded of a good responds to income, everything else the same
- $(\text{change in quantity } x / \text{average } x) / (\text{change in income } x / \text{average income } x)$
- $> 1$  = demand is **income elastic**, good is a **normal good**
- $> 0, < 1$ , demand is **income inelastic**, good is a **normal good**
- $< 0$ , the good is an inferior good

#### Elasticity of supply

- Measures the responsiveness of the quantity supplied to a change in the price of a good, when all other influences remain the same
- $(\text{Change in quantity supplied } x / \text{average } x) / (\text{change in price } x / \text{average price } x)$
- **Perfectly inelastic supply**- elasticity is 0, supply curve is vertical (same supply at all prices- i.e rare painting).
- **Unit elastic supply**- if the supply curve is linear and passes through the origin (**slope is irrelevant**)
- **Perfectly elastic**- horizontal and **elasticity of supply is infinity**. i.e. wheat growing vs corn, people will 100% switch if price is similar

#### Factors influencing elasticity of supply

- **Resource substitution possibilities**- if the resource to create a good or service is unique (i.e paintings by artists, it is highly inelastic). If resource to create good or service can be used for a variety of tasks, such as land for growing wheat vs corn, the goods are highly elastic.
- **Time frame for supply decision:**
- **Monetary supply** is perfectly inelastic or perfectly elastic. I.e farmers cannot instantly produce more oranges if the price changes (inelastic, as high price = same supply) or telephone

companies cannot charge more if a surge of people suddenly use their services (higher quantity supply= same price)

- **Short-run supply** is somewhat elastic, for example, firms can hire or fire more people to produce more supplies or an orange grower could let fruit rot, or put more fertilizer, but he cannot grow more trees
- **Long-run Supply** is elastic, possibly perfectly elastic. The orange grower could grow more trees, but it would take years for them to mature.

### Benefit, cost, and surplus

#### Producer surplus

- The excess amount received from the sale of a good over the cost of producing it
- Calculated as the price received for a good minus the minimum-supply price, summed over the quantity sold
- On a graph, producer surplus is shown by the area below the market price, and above the supply curve, summed over the quantity sold
- In marketplace, supply is referred to as the **marginal social cost**
- Below the graph, is the cost of production

#### Efficiency of competitive equilibrium

- If marginal social benefit exceed marginal social cost- increase quantity
- Marginal social cost greater than marginal social benefit-decrease quantity
- If they are the same, they are at equilibrium
- Resources are utilized efficiently **at equilibrium**. The total surplus is **maximized**
- (look at graphs on slides)

#### Is the competitive market efficient?

- **Market failure**- when the market delivers an inefficient outcome
- Can occur if too little of an item is produced, or too much of an item is produced
- Underproduction- too little product is made, and the quantity is inefficient (consumer surplus)
- Overproduction- too much product is made
- A **deadweight loss** equals the decrease in total surplus. This is a **social loss**

#### Sources of market failures

- Price and quantity regulations (price fixing, quantity restrictions, quotas), lead to underproduction.
- **Taxes and subsidies** – subsidized products overproduction, taxes lead to underproduction
- Externalities – the actions of one consumer or producer directly affect the economic actions of others. (i.e environmental pollution from industry destroys farmers' crops, causing underproduction in food) Can also benefit (subway could benefit businesses close to stations)
- **Public goods** - benefits everyone, and no one can be excluded from its benefits. Public goods **are non-excludable and non-rival in consumption. i.e (public park, library)**. It is in everyone's self-interest to avoid paying for a public good (free-rider problem), leading to underproduction.

- **Common resources**- owned by no one, used by everyone. It is in everyone's self-interest to ignore the costs of their own use of a common resource that fall on others (**tragedy of the commons**). Leads to overproduction (i.e. unregulated cod fishing).
- **Monopoly – a sole provider of a good**, in their self-interest, monopolies maximize their profit having a huge power over price. **Underproduction is the result.**
- High transaction costs – opportunity costs of making trades in a market. (i.e. stock market has a surcharge when buying stocks). Some markets are too costly to operate efficiently. High transaction cost- underproduction

### Alternatives to market

- No real efficient mechanism for allocating resources efficiently
- By supplemented majority rule, bypassed in firms by command systems, and sometimes using first-come first-served methods, markets do a decent job

### Fairness

- Ideas about fairness can be divided into 2 groups:
- It's not fair if the result isn't fair – only equality brings efficiency- called **utilitarianism** (greatest happiness for greatest amount of people). John Rawls calls for equal wealth distribution amongst people.
- Utilitarianists ignore the cost of making income transfers
- **Economics** think about the **big tradeoff** between efficiency vs fairness. Because of this, we cannot redistribute wealth equally
- **2. It's not fair if the rules are not fair.** Symmetry principle- people in similar situations are treated similarly. Boils down to **equality of opportunity, not equality of income.**
- Robert Nozick states that we should have **equality of opportunity, not income**: 1. State must protect private property. 2. Private property can only be exchanged voluntarily.
- This means if resources are allocated efficiently, they may also be allocated fairly- Nozick's rule is more fair today

### Utility and Demand

- Ex: you want an album. Will you buy album for \$12 off Amazon, or \$8 off iTunes. What determines our choices?

### Consumption choices

- The choices we make is influenced by many factors
- **Consumption possibilities** – all the things that you can afford to buy. **Consumer budget line** is limited by income- it shows the limit. (i.e. Lisa has 40 bucks, price of movie is 8, price of pop is 4). She can buy different combinations of items. The **inside of the budget line shows what she can afford**. We want to be **on the border**. Some goods can be divisible (i.e. hydro, gas)
- **Preferences**- the choice that Lisa makes depends on her **preferences**- likes and dislikes
- **Her benefit or satisfaction** from consuming a good is her utility
- **Total utility** is the total benefit a person gets from the consumption of goods. Generally, more consumption gives more total utility. Principle of decreasing marginal utility- **the more you consume of a good, less the marginal utility becomes**

- **Total utility curve**- will be an increasing function, but the slope is concave down.
- **Marginal utility**- falls the more a good is consumed.
- **To maximize utility**, we find largest total utility combination.
- **The maximum utility is called the consumer equilibrium**, it would give her the maximum utility.
- A more natural way of doing this is making choices at the margin- having made a choice, would spending a dollar more or a dollar less on a good bring more total utility?
- **Marginal utility per dollar**- the marginal utility from a good that results in spending **1 more dollar** on it. This is **marginal utility/ price**

#### Utility maximization

- Consumer has to spend all available income
- Has to **equalize marginal utility per dollar** for all goods. (marginal utility per dollar of good a is same as good b)
- **Quantity and marginal utility are negatively related**

#### If the price changes in the budget

- When the price of a good falls, quantity demanded increase- the demand curve slopes downward
- If the price of a movie falls, the utility equilibrium **is interrupted**. The utility given per dollar spent on movies is bigger than the soda, so we have more incentive to watch movies, and **vice versa**.

#### If a rise in income change

- If a rise of income occurs, we will increase consumption of **all goods**, assuming that it is consistent with our original ratio, which gave us the **equilibrium utility**.

#### The paradox of value

- Why is **water cheaper than diamonds**?
- We use so much water that the **marginal utility** of water is small, but the **total utility** is high.
- We buy few diamonds, so the **marginal utility** for a diamond is large, but the **total utility is small**.
- Marginal utility per dollar for water ends up being the same as the marginal utility per dollar for diamonds
- **Values and customer surplus**- supply of water is perfectly elastic, quantity of water is large, consumer surplus is **large**. **Supply for diamonds is inelastic**, quantity of diamonds is small, so consumer surplus is small.

#### Temperature: an analogy to describe the concept of utility

- **Utility is similar to temperature**. Both are abstract concepts, and both have units of measurement that are arbitrary. i.e 10 Celsius is not double as hot as 5 Celsius
- The concept of utility helps us make predictions about consumption choices in much the same way that temperature allows us to predict what to wear.
- Helps us understand why people buy more of a good when its price falls, and why people buy.

## Behavioral Economics

- **Studies** the ways which limits on the humans brains ability to compute rational decisions influences economic behavior
- **Three impediments to rational choices:**
- **Bounded Rationality-** bounded by the computing power of the human brain – faced with uncertainty, consumers cannot rationally make choices and rely of other decision making methods, such as **listening to others, instinct, rule of thumb, chance.**
- **Bounded willpower-** less than perfect willpower prevents us from making a decision that we know we will later regret. **i.e they have candy at the cash register, we are bored standing in line.**
- **Bounded self-interest-** the limited **self-interest** sometimes results in suppressing our own interest to help others. **i.e giving money to charity.**
- **The main** applications are in finance, where there is uncertainty to the return, **uncertain future is a key factor.**
- **The endowment effect** – the tendency for people to value something more highly just because they own it. lets **say we have a trade, and we have goods of the same value,** people would reject. There is a **value of owning it.**

## Neuroeconomics

- The study of the activity of the human brain when a person makes an economic decision
- Different decisions appear to activate different areas of the brain
- In the **pre-frontal cortex**, memories are stored, data analyzed, this is **rational**
- In the **hippocampus**, anxiety and fear are stored, **might be irrational.**
- **Controversy:** should we focus explain what we observe, or what goes on inside peoples minds.
- For most economics, the goal of economics is to explain **the decisions that are observed,** not what goes on their heads.

## Chapter 9, possibilities preferences, and choices

- We can describe the budget line by using a budget equation
- Expenditure = Income
- On a budget equation of 2 goods,  $pxqx+pyqy = Y$
- $y/px$  is your **real income** in terms of good x, i.e your total income, \$64, good xcost 8, real income is **8 of good x.  $y/py$  is income in terms of good y, similarly.**
- $Px/py$  is relative price of good x in terms of good y

## Indifference curves

- A line that shows combinations of goods where a consumer is indifferent
- We can sort all combinations of goods to three groups: preferred to a point, not preferred to a point, and just as good as a point
- Anything above the curve is **preferred to, below less than preferred, on the curve save value.**
- **Indifference curves are convex.**

## Preference map

- Series of indifference curve if  $i_0$  is an indifference curve below  $i_1$ , then one would prefer every point on the indifference curve  $i_1$  to  $i_0$
- This works for any curve that is **more to the northeast**
- **Non-cessation property- more is better**

### Marginal Rate of Substitution

- Marginal rate of substitution measures the rate at which a person is willing to give up good  $y$  to get an additional unit of good  $x$  while we stay on the indifference curve
- The **magnitude of the slope of the indifference curve measures the marginal rate of the substitution at a point**
- Steep curve – **mrs is high, flat curve- mrs is low**
- The mrs is also the **ratio of marginal utility**
- A diminishing the marginal rate of substitution is a **general tendency for a person to be willing to give up less of good  $y$  to get 1 more of good  $x$ , while at the same time remain indifferent as the quantity of good  $x$  increases.**
- Based on the principle of **decreasing marginal benefit (more of good, less marginal benefit)**
- Ordinary goods have a convex curve, **perfect substitutes** are linear, the **marginal benefit** per good remains the same, as a person does not care what they get.
- However, **if the budget line, and indifference curve are the same**, we cannot predict **consumer choices**.
- **Perfect complements i.e shoes**, if you buy one left shoe and one right shoe, **you're the happiest. You don't get anymore happiness** if you buy more of one type of shoe, as you cannot use it. we can have 1-1 or 2-2, but 1-5 is the same as 1-1 in terms **of happiness**.

### Best affordable choice

- The consumer's best choice is :
- **On the budget line, and the highest indifference curve they can reach**, and has a marginal rate of substitution between the two goods equal to the relative price of the two goods.
- **The price effect** shows how the demand curve is generated ( **budget line can swing in/out an change intercepts**)
- **Income change- budget line slides in or out**, this is called **the income effect**.

### Substitution and income effect

- For a normal good, a fall in **price always increases the quantity consumed**.
- **Can** be proven through substitution and income effect
- **Substitution effect** is the effect of a change in price on the quantity bought when the consumer remains on the same indifference curve. **i.e price of movies changes, but income also decreases**, so the budget line might **remain on the same indifference curve**.
- **Income effect – when income increases**, there is a parallel shift outward, **we move indifference curves**.

### Inferior goods and consumer choices

- For an inferior good, when income creases the quantity bought decreases.
- The income effect is negative, and works against the substitution effect

- So long as the substitution effect dominates, the demand curve still slopes downward.
- If the negative income effect is stronger than the substitution effect – a lower price for inferior goods brings a decrease in the quantity demanded- the demand curve slopes upwards
- This case does not appear to happen in the real world.

### Production and organization

- A firm is an institution that hires factors of production and organizes them to produce
- A firm's goal is to maximize profit. If the firm fails to maximize profit, the firm is either eliminated, or taken over by another firm
- Sometimes, it pays to be an ethical firm.
- Accounting profits measure a firm's profit to ensure that the firm pays the correct amount of tax, and also to show investors how money is being used
- Profit is total revenue minus cost
- Accountants use revenue Canada rules to calculate taxes

### Firms opportunity cost

- The value of the best alternative use of the resources that a firm uses
- This is the sum of the cost of the cost of using resources
- Three different ways measured: for goods bought in the market, goods owned by the firm, and goods supplies by the firm's owner.

### The firm and the economic problem.

#### Bought in market

- The amount spent by a firm on resources bought in the market is an opportunity cost of production because the firm could have bought something else.

#### Owned by firm

- For resources owned by the firm, if the firm owns and uses capital to produce output, it incurs opportunity cost, as they could have sold the capital somewhere else or rented it
- They implicitly rent capital from itself. The firms opportunity cost of using capital it owns is called the implicit rental rate of capital.
- The implicit rental rate is made up of economic depreciation, and interest forgone
- Economic depreciation is change in the market value of capital over a period
- Interest forgone is the return on funds used to require the capital.

#### Resources supplied by firms owner

- Owner might supply both entrepreneurship and labour
- Entrepreneurship returns profit
- The profit an entrepreneur can expect to receive on average is normal profit
- Normal profit is the cost of entrepreneurship and is an opportunity cost of production
- Owner might also supply labour but not take a wage. Opportunity cost of labour is wage income forgone by not taking the best alternative job

- Economic profit = **total revenue minus total opportunity cost of production.**

#### A firm's decisions

- To **maximize profit**, firm must make five basic decisions.
- 1. What to produce and in what quantities
- 2. How to produce
- 3. How to organize and compensate managers/workers
- 4. How to market and price its products
- 5. What to produce itself and what to buy from other firms

#### Constraints to firm's profit

- **Technology constraints.** Technology is any method of producing good/service. Advances over time. Using available technology, firm can produce **more only if it hires more resources, increasing its costs and limiting additional output**
- **Information constraints:** firm never possesses complete info about present or future, constrained by limited info about quality/effort workplace, current/future buying plans, and plans of competitors. **The cost of coping with limited information limits profit.**
- **Market constraints** – what a firm can sell and price it can obtain limited by customers willingness to pay, and other firms. The resources a firm can buy and prices it must pay are limited by willingness of people to work for/invest in the firm itself. **Expenditures** that a firm incurs to overcome these constraints limit **profit**.

#### Economic efficiency in production

- **Technological efficiency** occurs when a firm uses the least amount inputs to produce a given quantity of output
- **Different combinations of inputs may be used**, but only one is **technologically efficient**
- **If it is impossible** to produce a given good by decreasing any one input, holding others constant, then production is **technologically efficient**
- **Economic efficiency** occurs when firm produces a given quantity of output at least cost. Depends on cost of capital and labour. Difference between technological and economic: tech concerns **the quantity of inputs for a given quantity of output, economic efficiency concerns the cost of the inputs used**
- An **economically efficient product is also technological efficient**, but not vice-versa.
- Changes in input prices influence value of inputs, but not **the technological process for using them in production.**

#### Information and organization

- Firm organizes production by combined and coordinating productive resources using two systems
- **Command system:** uses managerial hierarchy. **Commands pass down, feedback passes up.** Relatively rigid, can have many layers of specialized management
- **Incentive system-** organized production using market-like mechanism to induce workers in ways that maximize profit (i.e commission)

- **Commands** are used when it is easy to monitor performance, or where small deviation from ideal performance is very costly (i.e manufacturing spaceplanes)
- **Incentive** can be used whenever monitoring is too costly/impossible.

#### The principal-agent problem

- The problem of devising compensation rules that induce an agent to act in the best interests of a principal
- For example, **stockholders of a firm are principals, managers are agents.**
- **Three ways to cope with this**
- **Ownership**- often offered to managers, gives managers incentive to maximize profit
- **Incentive pay** – links pay to firms performance, and helps align interests with those of the principals (commission)
- **Long-term contracts** – can tie managers or workers long-term rewards to the long-term performance of the firm. Encourages agents to work in the best long-term interests of the firm owners, the principals.

#### Types of business organization

- **Sole proprietorship**- single owner, unlimited liability (full responsibility for all debts), persons makes management decisions and receives profit, profits are taxed the same as actual income
- **Pros:** easy to set up, simple managerial decisions, only taxed once. **Cons:** bad decisions are not reviewed, firm dies with owner, owners entire wealth at stake, cost of capital and labor is high.
- **Partnership** – two or more owners, unlimited liability, partners must agree on management and how to divide profits. Profits are taxes as personal incomes of owners.
- **Pros:** easy to set up, diverse decision making process, survive withdrawal of a partner, profit only taxes once. **Cons:** consensus on decisions is difficult, entire wealth at risk, capital is expensive
- **Corporation**- owned by one or more stockholders, limited liability (only liable for their investment value), profit from corporations it taxes **twice- once as** a corporate tax, then again as **income taxes** paid by stockholders receiving their after-tax profits, distributed as **dividends.**
- **Pros:** limited owned liability, larger and low-cost capital available, professional management, lower costs for long-term labor contracts. **Cons:** complex management structure slow and expensive, profits taxed twice.

#### Markets and the competitive environment

- 4 types of market
- 1. **Perfect competition** – **many firms, many buyers**, all firms sell identical product, no restriction on new entry of new firms, both firms and buyers are well informed about prices and products of all firms in the industry. i.e **world markets in rice, wheat, corn, grain crops.**
- 2. **Monopolistic competition** – **many firms**, each firm produces a slightly different product, **called differentiation**, each firm possesses an element of market power, no restrictions on entry. i.e **brands of cereal.**
- 3. **Oligopoly** – **small number of firms**, might produced identical or differentiated products, barriers to limit entry into market (i.e dairy farms with quotas)
- 4. **Monopoly** – **one firm produces entire output, no close substitutes, barrier to entry**

- To determine the market structure of an industry, **economists measure the extent to which a small number of firms dominate the market.**

#### Two measures of market concentration

- **Four-firm concentration ratio**- percentage of total industry sales accounts for by four largest firms in industry
- **The herfindahl-hirschman index (HHI)** – square of **percentage market share** of each firm summed over the largest 50 firms in industry
- **There are limitations to only concentration measure** to determine market structure– geographical scope, barrier s to entry and firm turnover, and correspondence between a market and an industry

#### Produce vs outsource? Firms and markets

- **Firm coordination** – firms hire labour capital, land and by using mixture of **command/incentive, organize and coordinate their activities to produce goods and services**
- **Market coordination** – **markets coordinate production by adjusting prices**, making decisions of buyers/sellers factors of production and components consistent
- **Outsourcing** – buying parts or products from other firms is an example of market coordination of production

#### Why choose firms?

- Firms coordinate production when they can do so more efficiently than a market
- Four reasons: **lower transaction costs, economies of scale, economies of scope, economies of team production**
- **Transaction costs** are the cost arising from finding someone with whom to do business, raching agreement on price, and ensuring terms of agreement are fulfilled
- **Economies of scale** occur when the cost of producing a unit of a good falls as output rate increases
- **Economies of scope** arise when a firm can use specialized inputs to produce a range of goods at a lower cost than otherwise
- **Firms can engage in team production**, in which the individuals specialize in mutually supporting tasks.

#### Short run technology constraint

- To increase output in short run, firm must increase the amount of labor employed
- Three concepts describe the relationship between output and quantity of labour employed.
- 1. Total product 2. Marginal product 3. Average product
- **Product schedules. Total product** is overall amount of output able to be produced at a time
- **Marginal product** is change to total product from a one-unit increase in quantity of labour remains same. i.e 4 people make 100, hire 1 more, 5 people make 125 marginal product= 25.
- **Average product of labour is total prod/quantity of labour.**
- As quantity of labour employed increases, **total product increases**, it is possible to **reduce, but it is unlikely one would hire.**
- **Marginal product initially goes up**, but then it starts to **go down.**

## Product curves

- Total product curve shows total product as the quantity of labour employed changes, anything underneath the curve is achievable.
- Marginal product curve is the derivative of the total product curve. **Almost all production processes have the feature:** marginal goes up at first rapidly, then tails off to 0 slowly.
- Increasing marginal returns arise from increased **specialization and division of labour**.
- Diminishing marginal returns arise because each additional worker has less access to capital (i.e. not enough machines or in case of cattle, not enough feed)
- **this is the law of diminishing returns states that** that if the marginal product will eventually decrease
- **When marginal product equals average product, average product is at its maximum**
- To produce more output in short run, firm must employ more labour, which means it must increase its costs.

## Cost curves

- A firm's **total cost** is the cost of all resources used
- **Total fixed cost** is the cost of the firm's fixed inputs. Fixed costs do not change with output. (constant function). Same at every level
- **Total variable cost** is the cost of firm's variable inputs, variable costs do change with output
- **Total cost equals total fixed cost plus total variable cost.**
- **TVC curve and TP curves** are perfectly negatively related.

## Marginal cost

- Over the output range with **increasing marginal returns, marginal cost falls as output increases**
- Over range with **diminishing marginal returns, marginal cost rises**

## Average cost

- Average cost measures can be derived by dividing by amount of units
- AFC – the total fixed cost per unit of output
- AVC – total variable cost / output units
- ATC – total cost per unit of output
- $ATC = AFC + AVC$
- AFC is a declining curve, because fixed price always same
- AVC is u-shaped because **initially, marginal product exceeds average product, rising the average and falling the average product cost. However, eventually the opposite happens and cost increases**
- and ATC is also u-shaped and is above the AVC for same reasons. **Also, ATC falls at a low output because AFC decreases rapidly at the start, but then goes back up because AVC starts increasing.**
- It is important to note that ATC is minimized at a higher output than AVC
- **Marginal cost is decreasing at low levels, but law of diminishing returns kicks in and marginal cost goes up.** The minimum of ATC and AVC is where the marginal cost intersects it, these curves increase afterwards.

## Shape of cost and product curves

- Marginal cost is at minimum at the same output level at which marginal product is rising
- When mp is rising, mc is falling
- AVC is at minimum at the same output level at which AP is at maximum\
- When AP is rising, AVC is falling.
- These shift can shift in two factors: **technology, prices of factors of production.** \
- **Technology directly** influences both the product and cost curves – higher productivity = **lower cost**. If it results in firm using more capital and less labor, fixed cost increases, and variable cost decrease (i.e machines). **In this case ATC increases at low output, decrease at higher output.**
- Increase in **price of factor of production also changes cost**. Increase in fixed cost shifts TC and ATC, but not MC curve
- Increase in **variable cost** shifts TC, ATC, and MC curves upward

## Long run cost

- **All inputs are variable, all costs are viable**
- **Behavior of long-run cost** depends upon the firm's production function. **Production function is the relationship** between the maximum output attainable and the quantities of both capital and labour
- **These follow the rule** of diminishing returns. (first increases, then starts to slowly decrease the rate).
- **Marginal product of capital-** increase in output resulting from one unit increase in capital, ceteris paribus.
- **A firms production function exhibits diminishing marginal returns to labor** and also to capital, ceteris paribus
- **For each** amount of capital, short-run u-shaped cost curves for MC, AVG and ATC can be make
- **The larger the plant, greater** is the output at which atc is at a minimum
- **The long-run average cost curve** is made up from the lowest atc for each output level. Relationship between lowest attainable average total cost and output when both the plant and labour are varied
- **Planning curve that tells the firm the plant that minimizes cost at a given output range**
- Once firm has chosen a plant, the ATC shows the costs for that specific type of plant

## Economies and diseconomies of scale

- **Economics of scale** are features of a firms technology that lead to falling long-run average cost as output increases. **Diseconomies of scale increase long-run average cost as output increases**
- Constant returns to scale keep long-run average cost same as output increases
- A firm experiences economies of scale up to some output level, then it moves to constant returns or diseconomics of scale
- **Minimum efficient scale** is the smallest quantity of output at which long-run average cost reaches its lowest output. If long run average curve is U shaped, the **minimum point** identifies the minimum efficient scale output level.

## Perfect competition (chapter 12)

- Many firms sell identical products to many buyers

- No restrictions to entry
- Established firms don't have advantages over new ones
- Sellers/buyers are well informed about prices

#### When it occurs

- When firms minimum efficient scale is small relative to market demand, room for many firms in market
- Each firm perceived to produce good with no unique characteristics, customers don't care what they buy
- (i.e one brand of chips vs another)

#### Price takers

- Each firm is **price taker** – a firm that cannot influence the price of a good/service
- No single firm can influence price – each firm's output is **perfect substitute to output of other firms, demand perfectly elastic for the firm's product (i.e lays chips vs ruffle)**
- **However, market demand is not perfectly elastic**, as popcorn could be substitute for chips!

#### Firms decisions in perfect competition

- **How to produce at minimum cost** – perfectly competitive firms choose outputs that maximize its economic profit
- We can use **marginal analysis** to determine profit maximizing output. At the output point where **marginal revenue equals marginal cost, profit is maximized.  $MR > MC$**  means profit increases in output increases,  $MR < MC$  means profit decreases if input increases.
- **Temporary shutdown decision** – if firm incurs loss, must decide to exit or stay in market. If it decides to stay must decide whether to produce or shut down temporarily. The decision will **minimize loss**.
- **Loss comparisons**- total loss equals  $TFC + TCV$  minus  $TR$ . Or  $TFC + (AVC - P) \times Q$ . If firm shuts down,  $q$  is zero and firm must pay  $TFC$ . Thus, they incur loss equal to **tfc**. This is the **largest loss a firm must bear**
- **Shutdown point** – price and quantity where firm is indifferent between producing and shutting down. This is where  $AVC$  is minimum, and **mc crosses avc curve**. They incur loss equal to **tfc** from either action
- **What quantity to produce**
- a perfectly competitive firm's supply curve shows how firm's profit-maximizing output varies as market price varies
- Supply curve is linked to marginal cost curve, but at a price below the shutdown point, the firm produces nothing
- **The short-run market supply curve** shows the quantity supplied by all firms in the market at each price when each firm's plant and the number of firms remain the same
- **Between 0 and shutdown quantity, market supply curve is horizontal.**

#### Profit and losses in short-run

- Maximum profit is not always positive economic profit

- To determine whether firm is making economic profit or loss, **we compare firms average total cost at the profit-maximizing output with the market price**
- **3 possible outcomes –**
- **Price equals ATC, zero profit**
- **Price exceeds ATC –economic profit**
- **Price less than ATC- economic loss.**
- In a short run equilibrium, a firm might do all 3, but only one of them is a long-run equilibrium, because firms can enter or exit the market

#### Entry and exit

- New firms enter when existing firms make profit, firms exit when they incur a loss
- When new firms enter, market supply increases and market price falls
- As long as firms are making profits, they will **keep entering**
- **In the long run, the market price falls until firms are making zero profit**
- Exit is same, - firms incur loss, exit market price increases and market supply drops until zero profit

#### Changes in this (scenario- decrease in demand)

- Permanent Decrease in demand makes firm incur economic loss
- Causes some firms to exit in long run, decreasing supply and increasing price
- As price rises, quantity produced by all firms continues to decrease as more firms exit. **But each firm remaining starts to increase its quantity**
- A new long run equilibrium occurs when price is equal to minimum ATC
- Difference – **fewer firms produce equilibrium quantity**
- Increase in demand has a vice versa effect – in this example, a larger amount of firms produce **the equilibrium quantity**
- **External economies** – factors beyond control of an firm that lowers firms costs as industry increases
- **External diseconomies** – **factors beyond control that raises firms cost as output increases.**
- **The long-run market supply curve** shows how the quantity supplied in a market varies as market price varies, after all possible adjustments have been made.
- **Absence of external economics-** increase in demand does not change price in long run, supply curve horizontal
- **External diseconomies** – increase in demand brings higher price, supply curve upward sloping
- External economies – increase in demand lowers price, supply curve down sloping

#### Technological change

- Enables firms to produce at lower average cost and marginal cost – cost curves shift downward
- New technology firms come, price falls quantity increases. Eventually, a new long-run equilibrium emerges where all firms use the new technology, and price= minimum ATC, zero economic profit

#### Competition and efficiency

- $MSB=MSC$  – efficient usage of resources in competitive equilibrium  $Q_{demand}= Q_{supplied}$

- A consumer's demand curve shows how the best budget Allocation changes as the price of a good changes.
- Customers get most value out of their resources at all points along their demand curves
- Market demand curve is the marginal social benefit curve, with no external benefits
- Competitive firms supply curve shows how the profit maximizing quantity changes a sprice of good changes
- Firms get most value out of resources at all points along supply curve
- Again, without external cost market supply curve is **marginal social cost curve**.
- Total surplus is maximized in perfect competition

### Monopolies

- Monopoly is a market that produces a good or service for which no close substitute exists
- One supplier that is protected from competition by using barriers to entry – constraints that protect a firm from potential competitors

#### Barriers to entry

- **Natural barrier to entry- economies of scale enable one firm to supply entire market at lowest cost (bulk suuplying). For example, electricity.**
- **The LRAC** curve is still sloping downwards when it meets the demand curve – economies of scale are so powerful even when market demand is met!
- **Ownership entry- a firm owns a significant portion of a resource (i.e jewels).**
- **Legal barriers** – public/government franchise. Government license (i.e law license), or patents

#### Price setting

- **Single price monopoly** is a firm that must sell each unit at same price to everyone
- This captures **consumer surplus and converts it into economic profit**.
- Monopoly can discriminate – amongst buyers (i.e advance purchases) or quantity discounts (amongst units of a good)
- **A monopoly is a price setting, not a price taker – their output is the market demand.**
- To sell a larger output, monopoly must set a lower price
- For a single-price monopoly, marginal revenue is always less than the price at each level of output.
- Related a lot to elasticity of a good- for elastic goods, fall in price increase revenue, and vice versa.
- Total revenue is maximized when marginal revenue = 0
- In a monopoly, **demand is always elastic**

#### Pricing and output decisions

- **Monopoly faces same technology constraints** as competitive firm, but different market constraint.
- **It selects profit** maximizing quantity in same manner as competitive firm, where  $MR=MC$
- **Can set its price at highest level at which it can sell the profit maximizing quantity.**
- Compared to perfect competition, monopoly produces smaller output and charges a higher price

- However, monopolies are inefficient - **because price exceeds MSC. MSB exceeds MSC, deadweight loss arises**
- Some of the lost consumer surplus goes to the monopoly as producer surplus

#### Rent seeking

- Any surplus is called **economic rent**
- **Rent seeking** is pursuit of wealth by capturing economic rent
- **2 ways – buy a monopoly- transfers rent to creator of monopoly , or create a monopoly – use resources in political activity**
- This can exhaust monopolies economic profit, making them break even, as ATC increases

#### Price discrimination

- **Price discrimination – practice of selling for different prices. Many firms do this**
- **To be able to do this, monopoly must** – identify and separate buyer types, and sell products that cannot be resold. Price differences that arise from cost differences are not price discrimination
- **Perfect price discrimination occurs** if firm is able to sell each unit at highest price anyone is willing to pay. **MR = price and demand curve = MR curve!**
- **Profit maximizing output increases to the quantity at which price equals marginal cost**
- **Output increases, economic profit increases above that made by a single-price monopoly. Deadweight loss eliminated.**
- More perfectly monopoly can price discriminate, more close it is to competitive output ( $P=MC$ )
- Outcome differs though – 1. Monopoly captures entire consumer surplus 2. Increases in economic profit attracts rent-seeking activity that leads to inefficiency.

#### Monopoly regulation

- Government must regulate monopoly, as quantity produced less than efficient in natural monopolies
- Two theories about regulating monopolies
- **Social interest theory** – must seek out inefficiency and eliminate deadweight loss
- **Capture theory-** regulation serves the self-interest of the producer, who captures the regulator
- **Marginal cost pricing rule is a regulation that sets price equal to marginal cost**
- The quantity demanded **when  $P = MC$  is efficient!**
- **However, in this case the average cost exceeds price,** firms incurs loss
- **But regulation** allows firm to price discriminate to cover cost, or the monopoly might charge a one-time fee to cover its fixed costs then charge price equal to marginal cost to make up for this
- **Another alternative is use average cost pricing rule** – price equals average cost
- **This can** be a problem, as it is not possible for regulator to be sure what firms costs are
- **Regulators use** two practical rules – rate of return regulation and price cap regulation
- Rate of return regulation– **firm must justify its price** by showing its return on capital doesn't exceed a specified target rate
- Could end up serving self-interest of firm as managers have incentive to inflate costs and use more capital than efficient amount.
- Price cap – sets highest price that a firm can charge – gives incentive to operate efficiently.
- Lowers price increase quantity

## Monopolistic competition

- Large amount of firms compete, each firm produces a differentiated product
- Firms compete in quality, price marketing
- Free entry
- Each firm only has small share, limited market influence – also sensitive to average market price, but no one firm's actions directly affect the actions of another
- **Collusion, or** conspiring to fix prices is impossible

## Competing on quality, price marketing

- Quality - design, reliability, service
- Demand for each firm's product is downward sloping
- Tradeoff between price and quality
- Because product is differentiated, firm must market its product through advertising and packaging
- Profit maximizing –  $MR=MC$ . Price is determined from demand and is highest price a firm can charge for profit maximizing quantity
- Again, in the long run, there will be zero economic profit, meaning  $P=ATC$
- **Two key differences between monopolistic competition and perfect competition-** excess capacity – **when a firm produced less than the quantity at which atc is minimum**
- **Also, markup**, which is amount which price exceeds **MC**
- **Firms in monopolistic competition** operate with excess capacity in long-run
- **They produce less than** efficient scale, due to downward sloping demand curve
- **Firms in monopolistic completion operate with positive markup**
- Again, downward sloping demand curve drives this result
- In contrast, firms in perfect completion have no excess capacity or markup, as demand curve is perfectly elastic

## Efficiency

- **$P=msb$ , and  $MC = MSC$**
- **However, price** exceeds marginal coal, so  $MSB > MSC$ , causing deadweight loss and inefficiency.
- **The markup** that drives gap between price and  $Mc$  arises from product differentiation, variety is costly
- **Efficient degree of product variety is when  $MSB= MSC$**
- **The loss that arises because the quantity produce is less than efficient quantity is offset by the gain that arises from having variety**
-



