Economics CT 1 Notes Package:

Scarcity, Choice and Opportunity Cost:

Scarcity and Opportunity Cost:

- Scarcity: limited resources and unlimited wants
- Factors of production:
  - Land: all productive resources supplied by nature
  - Labour: human effort, physical and mental
  - Capital (physical): man-made resources such as machines, tools and factories
  - Entrepreneurship: organization, innovation and risk-taking
- Economic Agents:
  - Firms: uses resources to produce goods and services
  - Households: can refer to individual consumers
  - Government: provides good and services, redistributes income and wealth
- Rational Choices: weighing costs and benefits, and choosing alternative that achieves greatest benefit over cost
  - 1: What and how much to produce?
  - 2: How to produce?
  - 3: For whom to produce?
- Opportunity Cost: next best alternative that has to be forgone
  - Reason: only one alternative can be selected at one time (hence next best alternative)
  - Economic goods: use scarce resources in their production and involves opportunity cost
  - Free goods: require no resources to make them and have no opportunity cost
  - Opportunity cost is subjective (differs between individuals and communities), difficult to calculate (how to quantify choices), and varies with circumstance

Production Possibility Curve:

- Definition: maximum attainable combinations of output that can be produced in an economy within a specified period of time, when all the available resources are fully and efficiently employed at a given state of technology
- Assumptions:
  - 2 types of goods being produced (A vs B, consumer vs capital goods)
  - Fixed amount and quality of resources fully and efficiently utilized
  - Fixed state of technology within specified time period
- Downward sloping:
  - Illustrates concept of opportunity cost, choosing more of one good means having to give up the production of the other good
- Concave with respect to origin:
  - Increasing opportunity cost as more of a good is produced
  - Reason: resources in the economy are not perfectly suitable to production of both goods, as economy concentrates on production of one good, it starts using resources less suitable
  - Hypothesis: straight downward sloping line implies that there is a constant opportunity cost, only occurs when factors of production are perfectly suitable in the production of both goods
- Interpretation of PPC:
  - Points beyond PPC (unattainable combination)
    - Scarcity of resources: unattainable given the current state of technology and amount of resources, cannot be attained in production and consumption
    - Can only be achieved when entire PPC shifts outwards (potential growth)

- Points within PPC (attainable but inefficient)
  - Unemployment or underemployment of resources (productively inefficient)
  - The economy is not producing the maximum output possible
- On the PPC (productive efficiency)
  - All available resources are fully and efficiently utilized and shows maximum possible and attainable combination

- PPC Shifts:
  - Actual economic growth
    - Movement from point inside the PPC to point closer/on the PPC
    - Includes the percentage annual increase in national output
    - Results from greater and more efficient use of existing resources
  - Potential economic growth
    - Outward shift of the PPC
    - Increase in quantity/quality of resources and technological improvement
    - Refers to the increase in the economy's capacity to produce
    1. Increase amount of resources
       a. Population growth, immigration, raising retirement age
       b. Importing capital goods (machines)
    2. Improve technology
       a. More research and development to encourage innovation
    3. Improve quality of resources
       a. Education and skills upgrading
       b. Increase efficiency of production
  - Inward shift of PPC
    - Occurs if there was a reduction in quantity/quality of resources or loss in technology
    - Example: war resulting in loss of labour or natural resources
  - Tradeoff in Consumption:
    - Production of capital goods involves postponing current consumption, but will increase ability to produce more output in future
    - Production of consumer goods will lead to greater current satisfaction, having a better standard of living now (but in future will fall behind)
- Efficiency:
  - Productive efficiency: resources are fully and efficiently employed to achieve maximum output possible (at any point on PPC)
  - Allocative efficiency: produces and consumes combination of goods that maximizes welfare (at only one point on the PPC, where MSB=MSC)

Demand and Supply:

Demand Theory:

- Demand: amount that consumers are willing and able to purchase at each given price over a given period of time
- Law of Demand: quantity demanded of good/service is inversely related to its price ceteris paribus
  - Assumption 1: specific time period is involved
  - Assumption 2: except for price, all other factors are assumed to be held constant (non-price determinants of demand)
  - Assumption 3: consumers behave rationally and make decisions which maximize satisfaction

- Demand curve: represents maximum price that consumers are willing and able to pay for each quantity of good based on the additional satisfaction derived from marginal unit

- Downward sloping: income effect (when price of good rises, purchasing power of income falls and real income falls, afford less of the same good) and substitution effect (when price of good rises, switch to alternatives)

- Non-price determinants of demand:
  - **Taste and preference (taste more favourable, increase demand)**
  - **Income (change in income, change in demand)**
    - Normal good: demand increases with increase in consumer income
    - Inferior good: demand decreases with increase in consumer income
  - **Government Policies (tax and subsidy, change in demand)**
    - Direct Tax: disposable income decreases with increase in tax, demand decreases
    - Direct Subsidy: increase in subsidy, higher purchasing power, demand increase
  - **Expectations of future prices**
    - Expects price increase, current demand increase
    - Expects price decrease, current demand decrease
  - **Exchange Rates (currency)**
    - Fall in demand of good when currency strengthens, prices are higher
    - Depreciation makes goods more competitive due to low prices, increase demand
  - **Interest Rates (borrowing rate)**
    - Increase interest rate, reduced demand, greater cost of borrowing
    - Decrease interest rate, increased demand, lower cost of borrowing
  - **Price of interrelated good (substitutes and complements)**
    - Substitutes: price of good X increase, demand for good Y increase (quantity demanded of X decreases, more consumers choose Y)
    - Complements: price of good X decreases, demand for good Y increase (quantity demanded of X increases, more consumers need Y also)
  - **Population (absolute increase or demographic change)**
    - Increase in population, increase in demand

- Change in quantity demanded: response of consumers to changes in the price of commodity by moving along the same demand curve (downward or upward movement)
- Change in demand: change in conditions of non-price determinants of demand where the whole demand curve shifts (rightward or leftward shift)

- Consumer's Surplus: difference between maximum amount consumers are willing to pay for a given quantity of a good and what they actually pay
  - Measure of consumer welfare (more surplus = more satisfaction)
  - Surplus is area above price (Po) and below demand curve

Supply Theory:

- Supply: quantity of a good or service that producers are willing and able to offer for sale at each given price over a given period of time
- Law of supply: quantity supplied is directly related to a price of a product (same assumptions)
  - Higher price of good = greater quantity supplied

- Supply Curve: minimum price at which producers are willing and able to supply each quantity of the good or service
  - Upward sloping: increased marginal cost (with increased production of a good), higher price increases quantity supplied (higher marginal cost of supplying additional unit covered by increased marginal benefit)

        - Given time, if price of good remains high, more firms produce similar goods
        - Firms are encouraged to switch to producing more profitable goods

- Non-price determinants of supply:
    - **Price of factors of production**
        - Increase in price of factor inputs will decrease profits, thus decrease supply
    - **State of Technology**
        - Improvement in technology = increase productivity of factors of production = cost per unit of output decreases = increase supply
    - **Natural Factors**
        - Favourable climatic conditions increase supply
    - **Number of Firms**
        - More firms = more goods produced = increased supply
    - **Government Policies**
        - Indirect Tax: increase minimum price willing to sell good = decrease supply
        - Indirect Subsidy: increase supply
    - **Prices of interrelated goods**
        - Joint supply: Price of X increase = Qnty. supplied of X increase = Supply of Y increase (when one good is produced the other good is produced at the same time_
        - Competitive supply: Price of X increase = Qnty. supplied of X increase = Supply of Y decrease (when one good is produced, less of the other is produced)
    - **Expectations of future price changes**
        - Expects price increase = build up stocks by reducing supply (making higher profits)

- Change in quantity supplied: change in price of the good, movement along the same supply curve (upward or downward movement)
- Change in supply: change in supply conditions or non-price determinants, thus shifting existing supply curve (leftward or rightward shift)

- Producers' Surplus: difference between amount received by producers and the minimum amount that they were willing and able to accept to produce the good
    - Area above the supply curve and below the price equilibrium line
    - Sum of consumers and producers surpluses maximized = allocative efficiency achieved

Demand-Supply Model:

- Equilibrium: buyers and sellers are on aggregate satisfied with current combination of price and quantity of good bought or sold, with no incentive to change current economic actions
    - Quantity demanded = quantity supplied (if not, market is in disequilibrium)
    - Price above equilibrium, quantity supplied > quantity demanded, surplus in market leading to downward pressure on price
        - Producers are unable to sell output at existing prices, thus competing against each other to sell excess supplies by asking for lower prices
    - Price below equilibrium, Qs < Qd, shortage in market leading to upward pressure on price
        - Competition among consumers will increase market price
        - Consumers who do not succeed in purchasing the good at current prices offer higher prices, thus producers are willing to increase quantity supplied

- Simultaneous shifts
    1. Increase in both demand and supply
        a. Increase in demand > Increase in supply (price increase, quantity increase)

    b. Increase in demand < Increase in supply (price decrease, quantity increase)
2. Decrease in both demand and supply
    a. Decrease in demand > Decrease in supply (price decrease, quantity decrease)
    b. Decrease in demand < Decrease in supply (price increase, quantity decrease)
3. Increase in demand, decrease in supply
    a. Increase in demand > Decrease in supply (price increase, quantity increase)
    b. Increase in demand < Decrease in supply (price increase, quantity decrease)
4. Decrease in demand, increase in supply
    a. Decrease in demand > Increase in supply (price decrease, quantity decrease)
    b. Decrease in demand < Increase in supply (price decrease, quantity increase)

- Inter-related Demands
    - Substitutes
        - A substitute is a commodity that can be used in place of another
        - Satisfies the same want and are in competitive demand
        - Increase in price of Good A leads to increase in demand for its substitute
    - Complements
        - A complement is a good used in conjunction with another
        - Jointly demanded to satisfy the same want and are in joint demand
        - Decrease in price of Good A leads to increase in demand for its substitute
    - Derived Demand
        - Change in final product market causes demand for factor resource to change
        - Increase in demand for Good A leads to increase in demand for its factor input

- Inter-related Supplies
    - Joint Supply
        - Production of goods that are derived from a single product
        - Increase in the price of one leads to increase in supply of the other joint product
    - Competitive Supply
        - Production of one good or the other (produce more of one = less of the other)
        - Goods compete for the use of the same resources
        - Increase in the price of one leads to decrease in supply of the other joint product

Price Mechanism:

1. Signalling: prices communicate information to decision-makers
2. Rationing: prices ration scarce resources when demand exceeds supply
3. Incentive: prices motivate decision makers to respond to the information

- Economic Efficiency
    - Allocative Efficiency
        - Society produces and consumes a combination of goods and services that maximizes its welfare
    - Productive Efficiency
        - Firms are producing the maximum output for a given amount of inputs, or producing a given output at the lowest cost

Price Elasticity of Demand (PED):

- Definition: degree of responsiveness of the quantity demanded of a good to a change in its price
- Formula: % change in quantity demanded / % change in price
- Important: PED value is always negative so often the negative sign is ignored

- Price elastic (PED value >1): change in price of good leads to more than proportionate change in qnty. demanded
    - Curve shape: less steep gradient
- Price inelastic (PED value <1): change in price of good leads to less than proportionate change in qnty. demanded
    - Curve shape: steep gradient
- PED = infinity: change in price leads to infinitely large change in quantity demanded (drops to 0)
- PED = 0: change in price leads to no change in quantity demanded (Qd is the same)
- PED = 1: rectangular hyperbola, change in price leads to proportional change in qnty. demanded

- *Determinants of PED*
    - **Availability of substitutes**
        - More substitutes available = easily substituted = more price elastic
        - Narrower definition of good = more substitutes = more price elastic (apples vs oranges compared to fruits vs nutritional supplements)
    - **Habitual consumption**
        - Good purchased habitually = less price elastic
        - Usually a staple (food), necessity (electricity) or addiction (alcohol)
    - **Proportion of income spent on good**
        - Higher proportion of income spent = more people forced to reduce consumption when price increases = more price elastic
        - Why? Price change for big ticket items leads to huge impact on purchasing power
    - **Time period**
        - Longer the time period = more time to find substitutes = more price elastic

- Usefulness:
    - **Firms' Pricing Decisions (traditional objective to increase total profits by raising revenue)**
        - *Price inelastic, firms should raise price to increase total revenue (decrease in revenue due to decrease in quantity demanded is less than increase in revenue resulting from higher price)*
        - *Price elastic, firms should decrease price to increase total revenue (decrease in revenue due to lower price is more than offset by increase in revenue resulting form increase in quantity demanded)*
        - Total revenue = price x quantity
        - Short-run: more price inelastic, can adopt price adjustment strategy (raise price)
        - Long-run: needs product innovation or marketing strategies to make product less substitutable and hence more price inelastic
    - **Primary commodities and manufactured products**
        - Primary commodities have low PED, price inelastic (fewer substitutes)
            - High degree of necessity
            - Prices are more volatile based on supply (reduced supply = greater increase in price due to necessity of product)
        - Manufactured products have higher PED, more price elastic (have substitutes)
    - **Indirect Taxes**
        - More price inelastic = greater the government tax (impose higher tax since quantity demanded changes less due to tax, thus revenue does not decrease significantly)
    - **Trade Union and Wages**
        - Greater likelihood of wage increase if final product is price inelastic
        - Firms are more willing to agree to higher wage rate if demand is price inelastic

        - Why? If the demand for the final product is price inelastic, fall in quantity demanded will be less than proportionate to the increase in price = increase in total revenue
    - Note: to show the implications of PED (elastic vs inelastic), show a shift in the supply curve and hence the differing changes based on elasticity o demand
- Limitations:
    - Ceteris paribus assumption is unrealistic due to the dynamic real world
    - Assumes that total costs are kept constant (for increased profit), but this is impossible

Income Elasticity of Demand (YED):

- Definition: responsiveness of demand of a good to a change in consumer's income ceteris paribus
- Formula: % change in quantity demanded / % change in income
- Interpretation of YED:
    - YED < 0 (inferior good)
        - Increase in income leads to fall in demand for the good
        - Example: cheap foodstuff including margarine and broken rice
        - Replaced by better-quality goods as income increases
    - YED > 0 (normal good)
        - Increase in income will lead to an increase in the demand for the good
    - 0 < YED < 1 (necessity)
        - Demand for the good is income inelastic
        - Percentage increase in income produces a less than proportionate increase in Qd
        - Necessities (food, clothing) are income inelastic
    - YED > 1 (luxury)
        - Demand for the good is income elastic
        - Percentage increase in income produces more than proportionate increase in Qd
        - Luxury goods and services (air travel, fine dining) are income elastic
    - IF PED = 0, it means demand for good is satisfied completely at the prevailing level of income, such that any change in income will have no effect on demand (impossible)

- *Determinants of YED*
    - **Degree of necessity of good**
        - Greater necessity = greater income inelasticity of good
    - **Stage of economic development**
        - A necessity in a developed country might be a luxury in developing country
    - **Level of income of consumer**
        - A good can be luxury at low income levels, a necessity at middle income levels and an inferior good at high income levels

- Usefulness:
    - **Firm's Decisions (traditional objective of raising profits)**
        - If incomes are about to increase (economic boom)
            - Produce goods which are income elastic (luxury goods)
            - Make product for income elastic (more prestigious and luxurious)
            - Stock up more normal and luxury goods
        - If incomes are about to fall (economic recession)
            - Produce goods which are more income inelastic (necessities)
            - Reduce production to minimize losses)
    - **YED and the Government**
        - Allow the Government to project changes in policies (ie. Increase in income = more cars and traffic congestion = plan ahead)

        - Predict demand patterns based on income of consumers
- Limitations:
    - Ceteris paribus assumption unrealistic (taste and preference changes, price of good changes)
    - Business strategies which help generate higher revenue (ie. increase production of luxury good) will also incur higher costs (thus loss in profits which is undesirable)

Cross Elasticity of Demand (CED):

- Definition: responsiveness of demand of a good to a change in price of another good cet. par.
- Formula: % change in quantity demanded of A / % change in price of B
- Interpretation of CED:
    - CED > 0 (substitutes)
        - Increase in the price of one good will lead to increase in demand of other good
        - Larger the positive value of CED, the greater the substitutability of goods
        - * CED > 1 (close substitutes)
    - CED < 0 (complements)
        - Increase in price of one good leads to fall in demand of other good
        - Larger the negative value of CED, greater degree of complementarity of the goods
    - CED = 0 (unrelated)

- Usefulness:
    - **CED and Firms (extent of effect on demand when rival's prices change)**
        - Pricing policies
            - High positive CED relative to rival = need to respond to changes of rival
            - Strive to be cost efficient to lower prices
            - Able to predict effect on sale and revenue if rival's prices change
        - Marketing and sale strategies
            - If substitutes, a firm can make its good less substitutable so it is less affected by pricing policies of rival firms (ie. Provide better customer service, increase brand loyalty etc.)
            - If complementary, lowering the price of one good leads to increase in demand of another, thus firms can link marketing plans to pricing policy of another firm OR collaborate
- Limitations:
    - Ceteris paribus assumption unrealistic (since only the price of related good can change)
    - Business strategies which help generate higher total revenue may lead to higher costs

Price Elasticity of Supply:

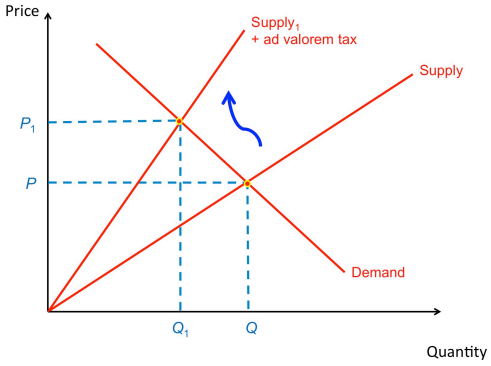
- Definition: responsiveness of the quantity supplied to a change in the commodity's own price ceteris paribus
- Formula: % change in quantity supplied / % change in price
- Interpretation of PES:
    - PES > 1: change in price of good leads to greater change in quantity supplied
    - PES < 1: change in price of good leads to smaller percentage change in quantity supplied
    - PES = infinity: producers willing to produce any quantity at prevailing price
        - Infinitely small decrease in price means quantity supplied falls to 0
    - PES = 0: No change in quantity supplied even with change in price
    - PES = 1: straight line, change in price of good leads to equal percentage change in qnty. supplied

- *Determinants of PES*
  - **Time period**
    - More time firms have to adjust their inputs, the larger the value of PES
    - More time = larger value of PES
    - Short-term: firms may be unable to change quantity it wishes to produce
  - **Factor mobility**
    - More easily resources can be shifted = greater responsiveness of quantity supplied = higher value of PES
  - **Number of firms**
    - Greater number of firms = output increases more easily = higher value of PES
  - **Stocks and spare capacity**
    - Good stored with ease = higher value of PES

- Usefulness:
  - **Primary commodity and manufactured products**
    - Primary commodities usually have lower PES than manufactured products
    - Ie. Agriculture requires long time for resources to be shifted in and out
    - Large price fluctuations mean large revenue fluctuations
  - Note: to show the implications of PES (elastic vs inelastic), draw a shift in the demand curve, before analyzing effects on price/Qd as a result of differing PES values
- Limitations:
  - Computation Issues: hard to determine the exact elasticity values
  - Ceteris paribus assumption unrealistic

Indirect Taxes

- General Information
  - 3 Types: general expenditure taxes, excise duties and custom duties
  - Lead to a leftward shift of the supply curve (Reason: minimum price that firms are willing and able to sell a given unit of the good is increased by amount per unit tax paid)
- Specific Tax
  - Constant sum levied on each unit of good sold (parallel shift)



- Ad valorem tax
  - Percentage tax which is pegged based on the price of the good
  - As price increases, the amount of tax to be paid increases (thus, pivotal shift of S curve)
- *Incidence of tax: distribution of the burden of taxation between consumers and sellers after the equilibrium price has risen after tax imposition*
  1. Price inelastic DD and elastic SS
     - Consumers bear higher burden of the tax (compared to producers)
     - Increase in price for buyers is less than the price of the tax (Qd decreases)
  2. Price elastic DD and inelastic SS
     - Producers bear a higher burden of the tax (Qd decreases)
  3. Perfectly price inelastic DD and elastic SS
     - Consumers will bear the full incidence of the tax
     - Rise in equilibrium price is equal to the amount of tax (with same Qd)
     - Consumers are unable to adjust consumption when price increases and pay any price
  4. Perfectly price elastic DD and elastic SS
     - Producers will bear the full incidence of the tax (decrease in Qd)

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- No change in equilibrium price

5. Price elastic DD and perfectly elastic SS
   - Consumers will bear the full incidence of the tax (decrease in Qd)
6. Perfectly inelastic SS
   - Producers will bear the full incidence of the tax (same Qd)
   - Price increases and producers are unable to adjust their output

- Taxation and Welfare
  - Allocative efficiency may not be achieved and deadweight welfare loss is experienced
  - Decrease in both consumer's and producer's welfare
  - Part of the loss goes to government in terms of tax revenue (overall change is negative)

Indirect Subsidies

- General Information
  - Payment to the producers by the government to lower cost of production
  - Supply curve shifts downwards by dollar amount of the subsidy per unit of the good
  - Benefits are shared between consumers and producers based on PED and PES

1. Price inelastic DD and elastic SS
   - Consumers receive a greater share of the subsidy
2. Price elastic DD and inelastic SS
   - Producers receive a larger share of the subsidy
3. Perfectly inelastic SS
   - Producer enjoys the full incidence of the subsidy
   - Producer is unable to alter his output level in response to the subsidy
4. Perfectly elastic SS
   - Consumers enjoy the full incidence of the subsidy

- Subsidies and Welfare
  - Allocative efficiency is not achieved and deadweight welfare loss occurs
  - Increase in both consumer's and producer's welfare
  - However, government expenditure exceeds gains in welfare (thus overall loss)

Price Controls

I. Price Floor

- General Introduction
  - Legally established minimum price to prevent prices from falling below a certain level
  - Price floor must be set above the market equilibrium price
  - Reason: provide income support + protect low-skilled and low wage workers
  - Effect: creation of surplus (where quantity supplied exceeds quantity demanded)
- Consequence 1: Surplus
  - Government has to buy up the surplus and either store, destroy or sell it abroad
  - Storage costs money, destroying it is a waste of resources, selling it abroad means reducing prices to remain price competitive but incurring higher costs
- Consequence 2: allocative inefficiency
  - Due to overallocation of resources to production of the good (higher price = attract new producers = further increase in surplus)
- Consequence 3: negative welfare impacts
  - Allocative efficiency not achieved along with deadweight welfare loss
  - Government spending to purchase surplus is financed out of taxes with alternative uses where opportunity costs are incurred
- Minimum wage effects
  - Labour surplus and unemployment
    - Fall in employers demand for labour + surplus of labour

        - Firms will face higher labour costs = switch to labour-saving techniques of production = higher productivity and lower costs of output
    - Illegal wave workers
        - Illegal employment of workers below legal minimum wage
        - Workers willing to supply labour below minimum wage to obtain jobs

II. Price Ceiling

- General Introduction
    - Legally established maximum price to prevent prices rising above certain level
    - Prohibition from selling above a stipulated price
    - Set below the market equilibrium price
    - Reason: achieve equity (make food/housing more affordable to low income earners)
    - Effect: creates a shortage
- Consequence 1: Shortage
    - Non-price rationing: failure of price mechanism due to price ceiling means queueing or distribution of coupons or favouring frequent customers
    - Black markets
        - Consumers are willing to pay a price above price ceiling to obtain good
        - People are incentivized to sell goods illegally at prices above maximum price
- Consequence 2: allocative inefficiency
    - Underallocation of resources due to lower quantity supplied
    - Too few resources allocated to the production of the good

Wages: The Labour Market

- General Introduction
    - Labour is a derived demand: to produce other goods and services
    - Demand based on monetary value of additional goods that additional labour produces
    - Supply: individuals willing and able to work for a given wage rate
- Price Mechanism
    - Wage rates above equilibrium
        - Qs of labour exceeds Qd, surplus + downward pressure on wage rates
        - Competition for jobs amongst workers forces wages down
    - Wage rates below equilibrium
        - Qd of labour exceeds Qs, shortage + upward pressure on wage rates
        - Competition amongst firms, willing to offer higher wage to obtain labour

- <u>Non-Wage Determinants (Demand)</u>
    A. Change in price of final product produced
        - ✓ Dependent upon demand of goods and services produced
        - ✓ Increase in demand of good = D shifts right for labour
    B. Change in productivity of labour
        - ✓ Advancement in production technology/education/retraining
        - ✓ Increase the output per worker (encourage firms to employ more of such workers)
    C. Change in prices of other factors of production
        - ✓ Capital seen as substitute for labour (use machinery instead of labour): D shifts left
        - ✓ Resource seen as complement to labour: increase in resource = D shifts right

- <u>Non-Wage Determinants (Supply) to the ECONOMY</u>
    a) Change in size of population
        - ➢ Foreign labour policy and birth/death rates
        - ➢ Falling birth rate + higher life expectancy = reduced supply of labour = S shifts left

b) Labour force participation rate
   - Percentage of economically active people under working age
   - Increase retirement age = increase workforce participation = S shifts right

c) Income tax and benefit levels
   - High personal income tax stifles incentive to work (or overly-generous benefits)
   - Increase tax = discouragement from working = S shifts left

- Non-Wage Determinants (Supply) to the INDUSTRY

i. Change in educational attainments
   - More highly skilled and specialized jobs = smaller supply of labour to the market
   - Lower education requirements = S shifts right

ii. Change in scope of job
   - Fringe benefits better = S shifts right

iii. Change in wage rate + non-wage benefits of other industries
   - Relative attraction of one job to others
   - Increase wage of other industries = S shifts left for this industry

- Wage differentials in Singapore

1. Non-competing groups
   a. Existence of many labour sub-groups (low supply of labour for one occupation vs another)
   b. Groups with different skill sets and abilities
2. Compensating differentials
   a. Jobs differ in attractiveness (higher risk = higher wage to compensate worker for non-pecuniary disadvantages of the job)
   b. Ie. Nerve strain, tiresome responsibility, high cost/length of training, low social prestige, short working life, seasonal layoffs and irregular employment
3. Labour market imperfections
   a. An industry with more powerful trade union has higher wage than other industries
   b. State can limit supply of foreign workers
   c. Certain professional bodies set pre-requisites for membership to restrict supply (lawyers)
4. Discrimination
   a. Race-based, gender-based discrimination

Firms and How They Operate

Introduction

Firm: organization or enterprise formed by profit-seeking entrepreneurs who bring together factors of production to produce goods or services for sale to consumers

Plant: physical location where factors of production are gathered for the purpose of producing goods or services (responsible for production only)

Industry: group of firms that produce a single good or service, or a group of related goods or services

Explicit costs: direct payments made to outside suppliers of input
- Wages, prices of raw materials, sunk costs

Implicit costs: costs which do not involve direct payment of money to a third party, but which nevertheless involves a sacrifice of some alternative
- Salary forgone by

Accounting costs: monetary value of explicit costs of production
Economic costs: monetary value of explicit + implicit costs of production

Firms: profit-maximizing by nature (revenue – economic cost) to survive in competitive environment

- Supernormal profit: TR > TC, AR > AC
- Normal profit: TR = TC, AR = AC
- Subnormal profit (loss): TR < TC, AR < AC

Other objectives of firms:

- Managerial theories of firm behavior
  - For larger firms, ownership belongs to shareholders while control of operations is largely dependent on directors and managers (with different objectives)
  - Principal-agent problem
    - Shareholders: profit maximization
    - Managers: sales revenue/growth maximization, staff benefits
- Satisficing behavior
  - Even more complex environment with owners, managers, workers, consumers (each with their own self-interest to maximize)
  - Sole focus cannot be on profit maximization
- Nationalized industries
  - Social and political objectives to consider
  - Seek to maximize social welfare and achieve allocative efficiency
- Imperfect information
  - Real world, lack of detailed information on demand and cost conditions
- Social enterprise
  - Instead of maximizing shareholder value, social enterprises aim to generate profit to further social or environmental goals (profit is viewed as means and not a primary goal)

Production (Short Run)

Definition: short run is a time period with at least one fixed factor of production (differs between industries)
Fixed Factor: input that cannot be increased in supply in short run (machines, land)
Variable Factor: input that can be increased in supply in short run (labour, raw materials)

Law of Diminishing Marginal Returns: as more units of a variable factor are applied to a given quantity of a fixed factor, there comes a point beyond which each additional unit of variable factor adds less to total output than the previous unit of variable factor

Stage 1: increasing marginal output (total output rises at increasing rate)

- Division of labour and specialization of tasks

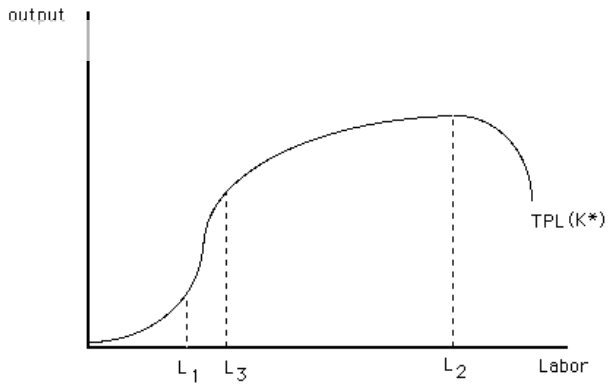
Stage 2: decreasing marginal output (total output still increases but at decreasing rate)

- Overcrowding arises and fixed factor is over-utilized
- Law of Diminishing Marginal Returns
- Marginal Output still positive

Stage 3: total output decreases (marginal output is negative and decreasing)

- Law of Diminishing Marginal Returns

Figure 8.1
Short Run Output Curve



Fixed Cost: cost that does not vary with output level (paid even when production does not occur)
Variable Cost: cost that varies with output level
Total Cost: sum of costs of all factors of production (TFC + TVC)
Average Cost: cost per unit of output (AVC, AFC and ATC)
Marginal Cost: cost incurred in producing an additional unit of output

AFC Curve: continuously downward sloping (constant TFC spread over larger quantities of output)
AVC Curve: U-shaped

- Increasing marginal return leads to initial decrease in AVC
- Subsequent increase in AVC due to decreasing marginal returns

ATC Curve: U-shaped (summation of AFC and AVC curves)

- NOTE: minimum point of ATC curve is to the right of AVC curve
- ATC and AVC converges as Q increases

MC Curve: U-shaped

- If MC > AVC/ATC, AVC/ATC will increase
- If MC < AVC/ATC, AVC/ATC will decrease
- NOTE: at the stage where AVC is increasing but ATC decreasing, MC is in between AVC and ATC

Production (Long Run)

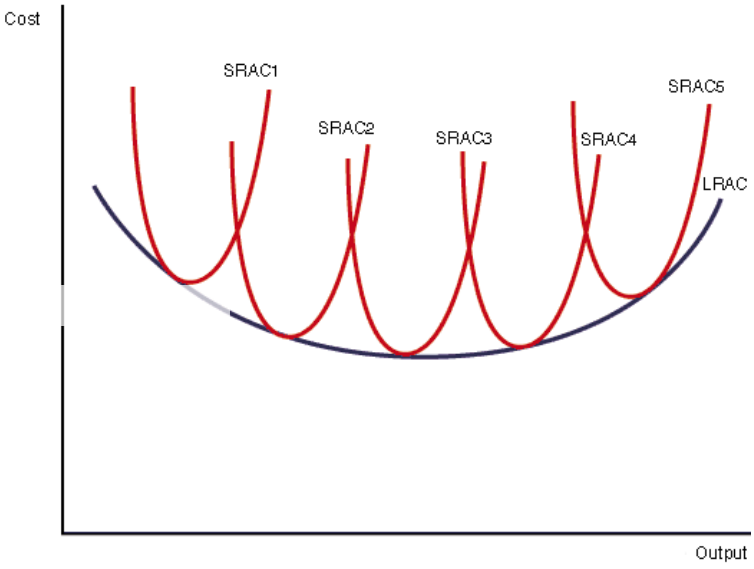
Definition: time period where all factors of production can be varied except for level of technology

Returns to Scale: what happens when all factors of production are raised by the same proportion

- Increasing returns to scale: output increases more than proportionately to increase in inputs
  - Falling section of LRAC curve due to technical economies of scale
- Constant returns to scale: output increases proportionately to increase in inputs
- Decreasing returns to scale: output increases less than proportionately to increase in inputs
  - Rising section of LRAC curve due to technical diseconomies of scale

LRAC Curve:

- Typically U-shaped
  - Average costs fall due to internal economies of scale (falling part of LRAC)
  - Average costs subsequently rise due to internal diseconomies of scale (rising part of LRAC)
  - LRAC will not rise sharply since size of firm can be increased to deal with output increase
    - Average costs lower in LRAC than SRAC for a given level of output (flatter)
- Minimum efficient scale: optimal level of output where LRAC is at minimum



- NOTE: LRAC curve is tangent to one point on the SRAC
- NOTE: SRAC can only be tangent to LRAC at its minimum point when LRAC is also at its minimum

Internal Economies of Scale (IEOS): savings in costs due to firm expansion (firm's own policies and actions)

- Technical Economies of Scale: directly relate to production process
  - **Factor indivisibility**: some inputs are of minimum size (large and costly) and cannot be used fully if output is small (plant operating below maximum capacity)
  - **Law of increased dimensions**: increased efficiency of machines and equipment with larger dimensions (like oil tankers reducing average cost of transportation with increased size)
  - **Specialization and division of labour**: simple and more repetitive jobs, less training needed
  - **Linked Process Economies**: integration of processes in one firm (save time, transport costs and energy)
  - **By Product Economies**: larger plants can offer better utilization of products
- Managerial Economies of Scale:
  - Increase productivity by employing specialists to supervise production systems
  - Raise productivity and creates efficient and cost effective management processes
- Marketing/Commercial Economies:
  - Large firms have bargaining advantage by buying in bulk (unit cost lower)
  - Economies in selling: bulk advertising and large scale promotion (more spread out costs)
- Financial Economies:
  - Easier and cheaper to raise funds for large firms due to better credit rating
  - Public listed companies can issue bonds and borrow money at lower interest rates
- Research and Development Economies:
  - Can afford to build laboratories and employ researchers
  - Such facilities have high initial capital outlay
- Welfare Economies:
  - Efficiency of workers can be increased by improving working conditions
  - Larger firms can afford amenities and programmes to encourage higher productivity
- Risk-bearing Economies:
  - Large firms can spread uncertainty in cost of production over large level of output
  - Wide variety of products in many geographic locations (spread risk, average costs low)
- Economies of Scope:
  - Large firms can increase the type of products they produce

Internal Diseconomies of Scale (IDOS): increases in costs due to firm expansion

- Complexity of management
  - Principal-agent problem: incentive for managers to reduce costs diminishes
  - Long chain of authority leads to rigid organization, thus loss of efficiency due to red-tape
- Strained relationships
  - Impersonal relationships between management and employees
  - Loss of loyalty to firm, sloppy work attitudes and apathy

External Economies of Scale: expansion of industry/concentration of firms in one location

- ❖ Entire LRAC curve shifts downwards (reduced cost at every output level)
- Economies of Concentration
  - **Availability of Skilled Labour:**
    - Demand for skill is large enough, special educational institutions set up to train people in such skills (firms pool resources)
  - **Well-developed Infrastructure:**
    - Better facilities set up to cater for the industries in one area
  - **Reputation:**
    - Large and well-established industry builds up a name which consumers associate with quality, increased brand loyalty and steady clientele (ie Silicon Valley)

- Economies of Disintegration
    - Subsidiary industries are developed to cater to needs of the major industry (supporting firm)
- Economies of Information
    - Publication of trade journals improves productivity of firms in the industry
    - Research and expertise concentrated to reduce costs (or government provision)

External Diseconomies of Scale:

❖ Entire LRAC curve shifts upwards (increased cost at every output level)

- Increased strain on infrastructure
    - Localization of activities leads to overtaxed infrastructure (ie traffic congestion)
- Rising factor costs
    - Larger industries leads to growing shortage of specific raw materials/skilled labour
    - Push up prices due to competition for resources, increase in firm's costs

MES and Number of Firms:

- MES large relative to market demand, can only have a few large efficiently sized firms
- MES small relative to market demand, high degree of competition with many efficiently sized firms

Growth of Firms

Measurement of Size:

1. Quantity of output sold
2. Total annual revenue
3. Market share: proportion of firm's revenue in the market
4. Amount of real assets owned by firm
5. Number of employees

Motives for Growth:

- Exploit available internal economies of scale (lower unit cost hence lower prices to edge out rivals)
- Greater economies of scale (larger range of products and markets)
- Greater market share (market power)
- Increase market valuation
- Reduce risk of takeover

Methods of Growth:

- **Growth by Internal Expansion**
    - Firm grows within the framework of existing management and control structure
    - Finance internal expansion by ploughing back profits, borrowing money or IPO
- **Growth by Merger or Acquisition**
    - Vertical Integration
        - Backward integration: merging with firm involved in previous stage of production
            - Greater control over quantity and quality of raw materials
            - Restrict availability of supplies to competitor
            - Absorb immediate profit margin
        - Forward integration: merging with firm in succeeding stages of production
            - Secure adequate number of market outlets
            - Reap greater economies in production
            - Accelerate development of new discoveries
    - Horizontal Integration: merging with similar firm at same stage of production
        - Market domination: reducing competition and increasing market power
        - Greater internal economies of scale and lowering unit costs
    - Conglomerates: combination of firms not directly related to one another

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        - Reduce risk of fluctuations by diversifying output
        - Ensures long-term growth
- **Growth by Franchising**
    - Franchising: right to use of a firm's successful business model and brand for prescribed period of time (supplier who allows operator to use trademark and distribute goods in return for a fee)

Existence of Small Firms

Demand side factors:

- **Nature of product**: perishables, preference for variety, specialized product with limited markets
- **Prestige markets**: limited by price (sports cars, luxury yachts)
- **Personalized services:** impossible to have mass production
- **Geographical limitations**

Supply side factors:

- **Reaching MES at low output levels:** small firms when diseconomies occur at low output levels
- **Low entry barriers**: easy for small firm to set up in industries where costs are low
- **Vertical disintegration**: production process is broken up into series of separate processes
- **Lack of capital:** expansion and large scale production require funds
- **Unwillingness to take greater risks**: risk of investment is grater
- **Banding:** small independent businesses band together to gain EOS while retaining independence
- **Profit-cycles:** needs time to grow and outpace rivals (at infancy of firm)
- **Non-profit maximization**: motivated by self-employment or prestige to have small business

Co-existence of Firms:

- Nature of industry LRAC curve: Firms can be cost-efficient over range of output
    - Small and large firms can be equally cost efficient and coexist
- Segmented market: small firms can cater to niche markets when industry caters to a diversified range of products and customers
- Disintegrated production process: small firms specialize in single process and make components for the larger firms
- Joint ventures: cooperation among smaller firms to protect interests
- Technological progress: recent developments favour small firms (small scale equipment)

Market Structures

Characteristics of Market Structures

1. Nature of products (homogenous vs differentiated)
2. Number of firms/sellers relative to market size (market concentration ratio)
3. Knowledge of product (perfect vs imperfect knowledge)
4. Barriers to Entry (Low vs High)

Perfect Competition:

- Characteristics of Market Structure
    - Large number of firms (insignificant market share)
    - Homogenous product
    - No barriers to entry
        - Factors of production are perfectly mobile
        - Fixed costs are minimal

- Perfect Knowledge (knows prices and profits of rivals)
- Impact on Behaviour
  - PC firm is a price taker (no control over its own price – takes the market price)
  - Demand for the firm's product is perfectly price elastic
    - Sell above prevailing, consumers find other substitutes
    - No incentive to sell below prevailing price (to profit maximize)
- Equilibrium of Firm (no tendency to change price and output decision)
  - Level of output where MR=MC and MC is rising
- Profits (SR vs LR)
  - Short Run: supernormal, normal or subnormal profits
  - Long Run: only normal profits (due to lack of BTE)
    - Supernormal profits = other firms attracted to enter market
    - Market supply increases = supply curve shifts to the right = surplus
    - Equilibrium price falls = supernormal profits eroded
    - Firms will make normal profit (AR=AC) and lower profit-maximizing output
    - **** Firm will produce at MES of the LRAC
    - Subnormal profits = shut down and leave market (no BTE to exit)
    - Market supply falls = equilibrium price increases = firms make normal profit

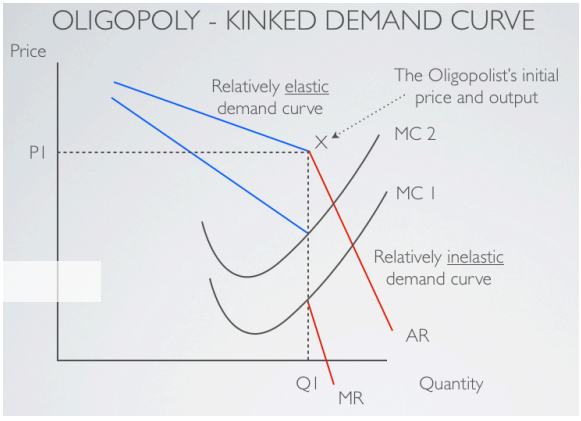
Monopoly:

- Characteristics of Market Structure
  - Single producer
    - Demand curve for the firm is the industry demand curve (downward sloping)
    - Can control output or price, but not both
  - No close substitutes for product
    - CED and PED is very low
  - High barriers to entry
    - New firms unable to enter industry = monopoly maintains supernormal profits
    - Barriers to entry are temporary = task of maintaining barriers
  - Imperfect knowledge of product
    - Technology guarded by the use of patents
    - Consumers not aware of costs and production of product
- Impact on Behaviour
  - AR and MR curves both downward sloping (AR>MR)
    - Reason: if monopolist does not practice price discrimination, it must lower price on all units to sell extra unit
  - Great price-setting ability (lack of competition)
    - Able to restrict output to increase prices
    - Can also practice price discrimination
  - Able to invest in R&D due to long run supernormal profits
    - Further entrenches market power
    - However, lack of existing competition might also lower incentive
- Barriers to Entry
  - Natural Monopoly
    - Incumbent monopoly operates on larger scale = substantial IEOS = larger MES relative to market demand = new entrants have small scale hence incur high cost and cannot compete
    - Substantial IEOS due to huge capital outlay or TFC incurred = very large MES where market demand can only support one firm operating efficiently
  - Strategic Entry Deterrence

        - General: product differentiation (convince about lack of substitutes)
        - Intensive advertising campaigns
        - Invest in extensive R&D
        - Engage in price cutting measures against new firm
    - Legal Barriers (patents, copyrights, licenses)
    - Control over Key Inputs
        - Controls supply of vital component = deny access to potential rivals
    - Mergers, collusions and takeover
        - Monopoly can takeover new entrants
        - Reduces level of competition + allows firms to expand in size (more IEOS, greater market share, larger product range)
- Profits (SR vs LR)
    - Can make all types of profits in SR (supernormal, normal, subnormal)
        - If subnormal profit, monopoly aims to minimize losses = will continue production is total revenue can cover at least all TVC
        - Why? Incurs greater cost if firm shuts down

Oligopoly:

- Characteristics of Market Structure
    - Few dominant firms relative to market size
        - Demand curve is download sloping = price setters
        - Degree of oligopoly power = market concentration ratio
        - Small number of competitors = action taken by one firm affects others = **large degree of mutual interdependence**
    - Products can be homogenous or differentiated
        - Homogenous = pure/perfect oligopoly
        - Differentiated = imperfect (less fear of rival's reaction)
    - Huge barriers to entry
        - Few dominant firms enjoy substantial IEOS
        - Able to retain supernormal profits in the long run
    - Imperfect Knowledge
        - Incomplete information regarding production methods and prices
        - Increases price setting ability of oligopolistic firms
- Pricing Behaviour (Kinked Demand Curve)
    - Firm unlikely to raise price above equilibrium price P1 (rivals unlikely to follow) = Qd falls by more than proportionate, thus fall in TR
        - Gentler AR curve above P1
    - Firm unlikely to reduce price below P1 (rivals will match price reduction) = Qd increases by less than proportionate, thus fall in TR (steeper AR curve)
    - Due to kinked AR curve, MR curve is discontinuous at equilibrium P1
        - Increase from MC1 to MC2 = absorb higher prices instead of passing it to consumers
    - THEREFORE, will match price reduction but not price increase



- Price Competition
    - Price wars or predatory pricing can arise = lower profits for all in SR = not preferred means

- Usually arise when there is considerable excess capacity in industry + initiated by firms with the largest MES

- Non Price Competition
  - Highly differentiated product = reduce fear of rival reactions
  - TYPES OF NON PRICE COMPETITION
    - Real physical differences (product development and innovation)
    - Imaginary differences (marketing techniques, advertising, packaging)
    - Differences in condition of sale (location of shops, quality of service)
  - Result of huge funding in R&D or large scale advertising
    - Advertising = raise consumer awareness + build brand loyalty = more inelastic D
    - R&D increase range and quality of product (more inelastic D)
- Co-operative: Collusion
  - Definition: formal or informal agreement on what prices to charge and how to divide the market to **reduce unpredictability of rivals reactions**
  - **Cartels**
    - Formally collude to set fixed price by restricting total industry output
    - Strong incentive to cooperate to maximize joint profits BUT also incentive to cheat secretly in order to increase share of profits
  - **Price Leadership**
    - Unwritten rules of collusive behaviour
    - Price set by market leader is accepted as market price by other firms

Monopolistically Competitive:

- Characteristics of Market Structure
  - Large number of buyers and sellers
    - Due to low barriers to entry
  - Differentiated products
    - Products are differentiated by quality, design, packaging, branding and promotion
    - Each firm has some degree of control over its own prices
    - IMPACT: gentler AR and MR curve compared to monopoly (due to presence of many close substitutes, thus demand is price elastic)
  - Low barriers to entry
    - Impact: firms can only make normal profits in the long run
  - Imperfect knowledge
- Pricing Behaviour
  - Pricing Competition
    - If firm lowers price, gains in sales revenue spread across many rivals = rivals suffer negligibly = less likely retaliation
    - Thus, firms can determine price-output policy with less consideration of rivals
  - Non-pricing Competition
    - Differentiate products from rivals = maintain customer loyalty + price-setting ability
    - Increase demand for product + make product more price inelastic (demand)
    - HOWEVER, due to lack of LR supernormal profits, extent and scale of non-price competition is limited compared to oligopoly

Assessing Performance of Market Structure

- Criteria for Assessing Desirability
  - Allocative Efficiency
    - Price = Marginal Cost
    - Maximizing both consumer and producer surplus (no deadweight loss)
  - Productive Efficiency

        - Macro-economy: resources used to maximum capacity (all points on PPC)
        - Society's POV: firm's LRAC is at its minimum = MES (IEOS exploited fully)
        - Firm's POV: any point on LRAC (lowest possible average cost for that level of output)
            - Also known as X efficiency
    - Dynamic Efficiency
        - Innovation arising from investment of scarce resources into R&D
        - Brings about better quality output, new products, new production methods
    - Equity
        - Fairness in distribution – wealth, income, opportunities
    - Consumer Choice
        - Freedom to choose from variety goods (consumer sovereignty)

- Allocative Efficiency
    - For PC firm, price=AR=MR, thus price=MC when MR=MC (always allocatively efficient)
    - Imperfect competition: profit-maximizing price > MC (allocatively inefficient)
        - Greater the price-setting ability = steep AR curve = more allocatively inefficient
- Productive Efficiency
    - PC firm will always produce at minimum point of LRAC curve

	Perfect Competition	Monopolistic Competition	Oligopoly	Monopoly
Number of Producers	Large number of buyers and sellers	Large number of buyers and sellers	Few dominant firms	One sole producer
Nature of Product	Homogenous: perfectly identical	Differentiated	Can be homogenous or differentiated	Unique product with no close substitutes
Knowledge of Product	Perfect Knowledge	Imperfect Knowledge	Imperfect Knowledge	Imperfect Knowledge
Barriers to Entry	No barriers to entry and exit	Low BTE in Long Run	Substantial BTE in Long Run Natural and Artificial BTE	Very high BTE Natural: high start-up cost Artificial: legal (patents)
Market Power	Price takers with no ability to set price	Control price or output but not both	High market power (based on market concentration ratio)	Complete market power: ability to set price/output
Decision to Stop Production	SR: AR < AVC LR: AR < AC	SR: AR < AVC LR: AR < AC	SR: AR < AVC LR: AR < AC	SR: AR < AVC LR: AR < AC
Profitability (SR)	Supernormal profits (AR > AC) Normal profits (AR=AC) Subnormal profits (AR < AC)	Supernormal profits (AR > AC) Normal profits (AR=AC) Subnormal profits (AR < AC)	Supernormal profits (AR > AC) Normal profits (AR=AC) Subnormal profits (AR < AC)	Supernormal profits (AR > AC) Normal profits (AR=AC) Subnormal profits (AR < AC)
Profitability (LR)	Normal Profits	Normal Profits	Supernormal Profits (substantial BTE)	Supernormal Profits (high BTE preventing entry of other firms to erode profit)
Revenue Curves	Straight line (P=MR=AR=DD)	Gentle gradient (two slopes)	Kinked demand curve	Steep gradient (two slopes)
Industry DD Curve	Downward sloping line	No industry DD curve (each firm sells differentiated products)	Same as Monopoly DD Curve	Same as Revenue Curve
Business Strategies	NIL	1. Pricing Strategies (rare) 2. Non-pricing (small scale product differentiation, but no R&D due to lack of supernormal profits + no price discrimination)	1. Pricing Strategies (price war in the SR, not sustainable) 2. Non-pricing (advertisement + R&D + production differentiation + collusion)	1. Pricing Strategies (price discrimination to make more profits) 2. Non-pricing depends on contestability (fear of potential entry): R&D or advertising
Efficiency	Productive and allocative	Not allocatively efficient	Not allocatively efficient	Not allocatively efficient

	efficiency attained	(P>MC) Not productively efficient (society's perspective)	(P>MC) Not productively efficient (X-inefficiency due to supernormal profits)	(P>MC) Not productively efficient (X-inefficiency due to supernormal profits)
Examples	Stock Market Agricultural Goods	Clothing and retail Bakeries Hairdressing Salons	OPEC (tacit collusion) SBS and SMRT Singapore telcos	Microsoft Singapore Power