I Market System

1 Central Economic Problem

Economics is the social science that studies the behaviour of individuals, groups, and organisations, when they manage or use scarce resources, which have alternative uses, to achieve desired ends.

The central economic problem is scarcity. Scarcity is the problem of having seemingly unlimited human wants in a world of limited resources; society has insufficient productive resources to fulfil all wants.

There are four main economic resources.

- Land refers to naturally occurring resources like forests, marine life and minerals in the earth. In other words, they are inputs into production provided by nature. Land is exhaustible and finite.
- Labour refers to all forms of human input, both physical and mental, into production. It is limited in terms of number and in skill level.
- Capital refers to inputs into production that have themselves been produced, like factories, machines, and tools.
- Enterprise refers to human resources that take risks and innovate. They bring together land, labour and capital to secure production. In many societies, production is limited by the lack of entrepreneurship, as people are not willing to take risks.

Due to scarcity, a society cannot have all that it wants, and it has to make choices about what, how, and for whom to produce. A society needs to decide and choose what goods it wishes to produce from the resources it has. A decision about what to produce implies a decision on how much to produce. It then needs to decide how to produce the goods it has chosen. In poor countries, a labour-intensive method is usually chosen, while in rich countries, a capital-intensive method is chosen. After producing the goods, society needs to decide whom gets the produced goods; there needs to be some means of allocating the output and deciding who gets what.

Any choice taken will incur an opportunity cost, which is simply the next best alternative forgone when picking one choice over an alternative. Individuals have limited income but unlimited desires to fulfil. Their objective is to maximise individual satisfaction and so they need to decide how much to spend and save and how to allocate their spending between their different desires. Any such decision made will incur opportunity cost. Firms have limited resources but unlimited production possibilities. Their objective is to maximise profits and so they must decide what type of and how much to produce in order to do so. Governments also have limited economic resources, but aim to maximise societal welfare. They need to decide how to allocate their resources to provide for their citizens to maximise their welfare. Any such decision will incur an opportunity cost.

Economic agents are assumed to make choices rationally. That is, they weigh up marginal costs and marginal benefits, applying the marginalist principle, to make decisions.

Marginal cost is the additional cost of doing one more unit of an activity, while marginal benefit is the additional benefit of doing one more unit of an activity.

In the case of an individual, if consuming one more unit of a good adds more benefit than cost, then it would be rational for the person to consume one more unit, and if consuming one more unit of a good adds more cost than benefit, then it would be rational for the person to consume one less unit. The individual will rationally choose to purchase at a level where their satisfaction is maximised, where marginal cost is equal to marginal benefit. This applies likewise to firms with profit, and governments with societal welfare.

In reality, the marginal benefit may not always be equal to the marginal cost due to time lag, information failure, and violation of the ceteris paribus assumption.

1.1 Production possibility curve

To illustrate choices, economists can use a production possibility curve. A production possibility curve (PPC) shows all possible combinations of 2 goods that could be produced by an economy assuming the full and efficient utilisation of a fixed quantity of resources and a given state of technology.

A PPC can be used to illustrate four fundamental economic concepts.

Scarcity is shown by the set of points outside the curve. Points outside the curve are unattainable given the productive capacity of the economy represented by the curve. These points exist because the economy does not have enough resources to produce the points outside the curve.

Choice is shown by the set of points on the curve. The economy can choose to produce any combination on the curve depending on its objectives.

Opportunity cost is shown by the negative slope of the PPC. To produce more of one good on the PPC, less of the other good must be produced, which is opportunity cost. The value of the slope of the PPC at a point is a measure of the rate one good can be transformed into the other at that point, that is, it is the marginal rate of transformation of one good into the other.

Increasing opportunity cost is shown by the increasingly negative slope of the PPC, or the PPC being concave as seen from the origin. The opportunity cost of producing successive additional units of one good increases. Increasing opportunity cost occurs because

resources are imperfect substitutes: factors of production, or resources, are more suitable for the production of one good than they are for other goods. People have different skills, different products require different raw materials, and so on.

Unemployment is shown by the points inside the PPC. Points inside the PPC occur when the economy is not using all of its resources, or it is not utilising the most efficient methods of production, or both. If resources are used more fully and efficiently, the economy can produce on the curve instead, producing more of both goods.

A movement along the PPC means a reallocation of the available resources; that is, resources originally used for one good are now being used to produce another.

A shift of the PPC means that there has been a change in quantity or quality of productive resources or the state of technology. If there is an increase in the quantity or quality of productive resources, or an improvement in the state of technology, the economy will be able to produce previously unattainable combinations of output, because respectively either the resource base has increased, or the economy can now produce more from the same resource base, or both. There will be an outward shift of the PPC, representing potential economic growth. If the opposite occurs, due to, for example, the destruction of natural resources due to fires or a fall in the productivity of labour, the PPC shifts inwards, showing lower potential economic growth.

If a nation invests in capital goods, their economy is likely to grow at a faster rate in the future. Capital goods, as opposed to consumer goods, are man-made goods that aid in future production. Increasing the production of capital goods, or capital accumulation, will benefit the nation, but producing more capital goods in the current period will mean less consumer goods can be produced in the current period.

1.2 Specialisation, division of labour and comparative and absolute advantage

Specialisation occurs when individuals, firms or nations concentrate on the production of specific goods and services, typically those in which they have some sort of advantage in.

An absolute advantage exists when an agent is able to produce something with less resources than another agent. A comparative advantage exists when an agent is able to produce something while incurring a lower opportunity cost than another agent.

In a household, one person may be tasked to do the ironing while another does the cooking. At the workplace, some people are programmers while others handle the accounts of the company. Specialisation allows individuals to concentrate on what they are best at, so more goods and services will be produced.

At the international level, specialisation can take place where countries focus their production on goods and services in which they have a comparative advantage. This allows countries to specialise on what they are best at and so world output of services and goods will be increased.

The law of comparative advantage states that trade can benefit all countries if they specialise in the goods in which they have a comparative advantage. Division of labour is when production is broken down into a number of simpler, more specialised tasks, allowing workers to achieve a high degree of efficiency, leading to lower unit costs of production, as **(a)** workers will be more familiar with the aspect of production they perform; **(b)** workers require less training time as they need only to be taught how to perform the few roles they have, so less cost is incurred in training workers, and they can get to work faster; and **(c)** workers do not need to multitask, so time is saved.

Division of labour may also cause higher costs for firms and disadvantages for workers, as **(a)** workers may become complacent or bored, leading to errors and a decrease in productivity, leading potentially to higher unit cost of production; **(b)** workers are less flexible, being trained in only a few specific roles, so if that worker is absent or leaves the firm, other workers cannot replace that worker until they are given training; and **(c)** workers, being trained only in specific skills, may find it difficult to find new employment if he is fired.

Specialisation and trade can lead to interdependence between countries.

When countries rely on other countries, those countries may be badly affected if the depended-on countries experience disasters or economic downturns. Singapore, for example, is always affected when there is an international crisis, like the 2003 SARS outbreak or the 2008 global economic crisis, as Singapore relies largely on its exports for revenue — in February 2008, Singapore's exports fell by 23.7%, and this is cited to be a reason for Singapore's poor economic growth in 2009.

Economies may be more susceptible to imported inflation. In the first half of 2007, high oil prices caused the Consumer Price Index of many countries to increase. The increase in demand for food and commodities in emerging economies also caused food prices in many countries to increase.

2 Competitive Resource Allocation

A market economy is an economic system in which the decisions regarding investment, production and distribution are based on the interaction between demand and supply forces.

The price mechanism is the process in a market economy where consumers and businesses interact to deter-

mine the allocation of scarce resources between competing uses.

Prices serve two functions in the market — namely, the signalling function and rationing function. In a market economy, prices are determined by demand and supply forces. The decisions of producers determine supply, while the decisions of consumers determine demand.

The market equilibrium occurs at a price where the quantity demanded is equal to the quantity supplied. Ceteris paribus, there is no tendency for this price to change.

2.1 Demand

Demand is the quantities of a product that consumers are willing and able to buy at various prices per period, ceteris paribus. It is determined by the private benefit that consumers get from consuming an additional unit of the good, also known as the marginal private benefit.

The law of demand states that the higher the price of a good, the lower the quantity demanded, c.p., because as prices increase, a given income can purchase fewer units of the good, and consumers may choose to purchase cheaper substitutes, thereby decreasing the demand for this good.

A change in the price of a product causes a movement along the demand curve. A change in non-price factors of demand will cause a shift in demand. An increase in demand means that at every price, the quantity demanded of the good increases, and vice versa.

2.1.1 Demand factors

Income affects demand as when income increases, consumers' purchasing power increases and they are more willing and able to pay for normal goods, so the demand for normal goods goes up.

When the prices of substitutes fall or of complements increase, demand for the good falls.

Tastes and preferences of consumers also affect demand and supply. A change that makes a good less desirable will decrease the demand for a good, and vice versa.

Consumers' expectations regarding future prices can affect demand. E.g. if consumers expect that prices will fall in future, consumers may reduce demand in the current period and wait till prices fall so that they can pay the lower price.

Government legislation can influence the decisions of consumers and in turn affect demand. For example, if the government implements a law where all buses must have seatbelts, the demand for seatbelts will increase sharply.

Other factors including interest rate can affect demand. Interest can be seen as the cost of borrowing; if it is cheaper to borrow, for goods like houses, consumers may be more willing and able to purchase, so demand increases.

2.2 Supply

Supply is the quantities of the product that suppliers are willing and able to sell at various prices per period, ceteris paribus.

The law of supply states that the higher the price of a good, the higher the quantity supplied, c.p., because as prices increase, the profits of firms per unit of the good sold increases, inducing firms to supply more, and in the short run, the cost of producing an additional unit generally increases as output increases, so firms require a higher price to produce more.

A change in the price of a product causes a movement along the supply curve. A change in non-price factors of supply will cause a shift in supply. An increase in supply means that at every price, the quantity supplied of the good increases, and vice versa.

2.2.1 Supply factors

Changes in the unit cost of production will affect supply as an increase in the unit COP will result in a lower potential profit per unit, so producers decrease the good's production and supply drops.

If a new method of production that is able to produce a good more efficiently is found, more output will be produced with the same amount of input. C.p., this means a lower unit cost of production.

If the profitability of a good in competitive supply increases or in joint supply decreases, supply of the good decreases.

Government policy, like taxes or subsidies, can also affect the supply of a good.

If the number of sellers decreases, the supply drops, and vice versa.

If an expectation that prices will increase in future exists, suppliers may decrease supply in the current period to take advantage of the higher prices in future.

2.3 Market adjustment process

If demand and/or supply shifts, the market adjustment process takes place. At the initial equilibrium E_1, equilibrium price is at P_1 and output is at Q_1. After the shift, at the initial equilibrium, quantity supplied is Q_s while quantity demanded is Q_d. There is a shortage/surplus of Q_sQ_d units of the good, causing upward/downward pressure on prices. As prices increase/decrease, quantity demanded decreases/increases while quantity supplied increases/decreases until both are equal at Q_2. The final equilibrium is at E_2, with equilibrium price increasing/decreasing to P_2 and output increasing/decreasing to Q_2.

If there is a simultaneous shift in demand or supply, price or quantity may be indeterminate, unless it can

be established that the shift in demand is greater than the shift in supply, or vice versa.

2.4 Related markets

Markets can be related to each other. Suppose we have a good A.

A complement to A is a good that must be used with A to satisfy wants and needs. If the price of the complement increases, the demand for A will fall.

A substitute to A is a good that satisfies the same needs or wants as A. If the price of a substitute falls, the demand for A will fall.

The demand for A can be a derived demand if another good uses A in its production, e.g. if A is steel, then the demand for A is derived partly from the demand for cars and ships. If the demand for cars and ships increases, then the demand for A increases.

A good in joint supply with A means that it is produced jointly from the same resources as A, e.g. if A is beef, then the good could be leather: leather and beef can both be produced from the same cow. The increase in supply of beef will lead to an increase in supply of leather, and vice versa.

A good in competitive supply with A means that it is produced exclusively from the same resources as A, and using the resource to produce A means that it cannot be used to produce the other good. Ceteris paribus, increasing the supply of A will decrease the supply of the other good.

2.5 Surplus and welfare

Consumer surplus is the difference between what consumers are willing to pay for a unit of a good and what they actually pay for that unit of a good. It is a measure of consumer welfare.

Producer surplus is the difference between the revenue producers receive from the sale of a unit of the good and the price at which they are willing to supply that unit. It is a measure of producer welfare.

Societal welfare is the sum of consumer welfare and producer welfare. On a demand and supply diagram, it is represented by the triangle formed by the P-axis, the demand curve, and the supply curve, up to the market equilibrium.

Total revenue or total expenditure

$$TR = TE = \textit{price per unit} \times \textit{units sold or purchased}$$

2.6 Elasticities of demand and supply

2.6.1 PED and PES

Price elasticity of demand measures the degree of responsiveness of quantity demanded of a good to a change in the price of the good, ceteris paribus. It involves a movement along the demand curve. *PED* is given by percentage change in quantity demanded of the good over percentage change in price of good. *PED* is always negative as the price and quantity demanded of a good are inversely related.

Price elasticity of supply measures the degree of responsiveness of quantity supplied of a good to a change in the price of the good, ceteris paribus. It involves a movement along the demand curve. *PES* is given by percentage change in quantity supplied of the good over percentage change in price of good. *PES* is always positive there is a direct relationship between price and quantity supplied of a good.

Values of *PES* and *PED* have certain meanings.

- $PE = 0$ means demand or supply is perfectly price inelastic: quantity demanded or supplied is constant as price changes.
- $0 < PE < 1$ means demand or supply is price inelastic: a given change in price leads to a less than proportionate change in quantity demanded or supplied.
- $PE = 1$ means a given change in price leads to an exactly proportionate change in quantity demanded or supplied.
- $1 < PE < \infty$ means demand or supply is price elastic: a given change in price leads to a more than proportionate change in quantity demanded or supplied.
- $PE = \infty$ means demand or supply is perfectly price elastic: an infinite amount will be bought or sold at some price or below, but zero above that price.

2.6.2 PED and PES factors

There are numerous factors affecting *PED*.

The availability of substitute goods affects *PED*. The greater the availability of substitutes for a good and the closer these substitutes are, the more price elastic the good, as when the price of the good increases, consumers are likely to switch to these substitutes.

The greater the proportion of income spent on the product, the more price elastic the good, as when the price of the good increases, people are more likely to reduce consumption.

The longer the period of time under consideration, the greater the effect of a change in the price of the good on the quantity demanded (the more price elastic the good), as over time, new substitutes can be developed, habits can be broken, etc.

If a good is addictive or habit forming, like cigarettes or liquor, it will tend to be more price inelastic, as consumers will not easily break their habits when price increases.

If a good is a luxury ($YED > 1$), then it is likely to be more price elastic as they generally can be forgone if needed when price increases, compared to a necessity — people are not likely to reduce their consumption of food significantly when price increases.

There are also numerous factors affecting *PES*.

The behaviour of cost as output increases affects *PES*. If there are severe diseconomies of scale as output increases, supply will tend to be more price inelastic as firms will be discouraged from reducing more if price increases as the higher price may not be enough to offset the increase in unit cost of production, which will cause a decrease in profit per unit.

The shorter the period in consideration, the more price inelastic the supply as firms cannot increase production easily in a short period due to fixed factors of production.

In the short run, markets with spare productive capacity will tend to have a more price elastic supply as producers can increase their production easily by utilising their spare capacity.

If a product can be stored cheaply with minimal loss of quality, supply will tend to be price elastic while stocks last as firms can increase their output by selling from their stocks when price increases.

If there is factor substitutability i.e. one factor of production can be easily substituted with another, or factor mobility i.e. it is easy to move resources from place to place or industry to industry, then supply will tend to be more price elastic.

If there are barriers to entry then supply will tend to be more price inelastic as it is difficult for new firms to enter the market when price increases, and so supply is limited to the limited suppliers.

2.6.3 YED and XED

Income elasticity of demand measures the degree of responsiveness of demand of a good to a change in income, ceteris paribus. It involves shifts in the demand curve in response to changes in income. *YED* is given by percentage change in demand of a good over percentage change in income.

If *YED* is negative, it means demand of the good decreases as income increases i.e. the good is an inferior good. If *YED* is positive it means demand of the good increases as income increases i.e. the good is normal.

For $0 < YED < 1$, it means the demand of the good increases less than proportionately for a given increase in income, and the good is a necessity. The demand of the good is income inelastic. For $1 < YED < \infty$, it means the demand of the good increases more than proportionately for a given increase in income, and the good is a luxury. The demand of the good is income elastic.

The main factor affecting *YED* is the degree of necessity of the good, or the nature of the good. The higher the degree of necessity for a normal good, the lower the *YED* of the good.

Cross elasticity of demand of a good A with respect to the price of another good B measures the degree of responsiveness of demand of good A to a change in price of good B, ceteris paribus. It involves shifts in the demand of A in response to changes in price of B. *XED* is given by percentage change in demand of good A over percentage change in price of B.

If $XED < 0$, the goods are complements, and if $XED > 0$, the goods are substitutes. If $XED = 0$, the two goods are independent i.e. they have no relationship to each other. The greater the magnitude of *XED*, the closer the relationship of the two goods.

The main factor affecting *XED* is the closeness of the two goods i.e. whether they are substitutes or complements and how close of a substitute or complement they are.

2.6.4 Limitations of elasticities

Elasticities of demand and supply can be useful, but they can be limited.

Elasticity figures studied are usually outdated as data is usually collected prior to them being used, so they are rarely, if ever, representative of current economic conditions.

Also, the ceteris paribus assumption does not apply in the real world. Elasticities only consider two variables at once and all other factors must remain unchanged. This never happens in reality.

3 Market Structure

3.1 Objectives of firms

Profit is the difference between the total revenue and total cost. In economics, firms are assumed profit-motivated and so will price to maximise profits.

Profit is maximised if a firm produces at an output where marginal cost equals marginal revenue when marginal cost is increasing, where marginal cost (*MC*) is the cost of producing the last unit of output, and marginal revenue (*MR*) is the revenue gained by selling the last unit of output. If the firm produces at a level below that output, then producing an additional unit of output adds more to revenue than to cost, increasing profit. While $MR > MC$, profits are increased by producing more. If the firm produces at a level above that output, then producing an additional unit of output adds more to cost than revenue, decreasing profit. While $MC > MR$, profits are increased by producing less. Therefore, profit is maximised at the point where $MC = MR$ when *MC* is increasing.

In reality, firms may not be able to identify the profit maximising price and output, as there is lack of information and the ceteris paribus assumption does not hold, as conditions of demand and supply are continuously changing, so even if firms know the profit maximising output level, they might not be able to determine the correct price to sell their goods. Notwithstanding that, it is difficult for firms to even determine the demand curve they face or predict how competitors may behave in response to their actions.

Many firms thus practice cost-plus pricing, where they estimate their long run average cost and add a profit margin to arrive at the price.

Some firms may choose not to maximise profits to avoid unwanted attention from the government, who may be concerned that these firms are exploiting customers, or from other firms, who are likely to be interested in any profitable assets they have.

Firms can choose to maximise sales revenue, as it can make it easier for them to take out loans. Sales revenue is maximised when $MR = 0$, as total revenue will be at a peak at this point. The level of output is likely to be past the profit maximising point, but the firm can still earn supernormal, normal or subnormal profits, depending on total revenue and total cost at this point.

Firms can choose to maximise sales volume, as employees' status and salary are often more linked to the size of the firm than its profitability. Sales volume is maximised when average cost equals average revenue. A firm can choose to produce above this level, but this level is the highest output level that the firm can earn normal profits. The firm will always earn normal profits at this point.

Firms can choose to profit satisfice, where firms aim for a profit level that will keep shareholders happy.

Firms may be reluctant to accept the risks and pressures associated with fiercely competitive policies, or they may be aiming to satisfy other stakeholders. Stakeholders include consumers, who want low prices and high quality; workers, who want high wages and job satisfaction and security; suppliers, who want high prices; community, who want employment without congestion; and environmentalists, who want clean environments and the conservation of flora and fauna. Profit satisficing may conflict with profit maximisation in the short run, but is compatible in the long run. Showing concern for the environment, for example, by avoiding nature reserves or not selling genetically modified foods, may raise a firm's costs, but it will also provide the firm with good publicity and may increase demand for the firm's products, creating brand loyalty. In the long run, revenue may rise more than costs, increasing profit.

3.2 Costs of production

A plant is a site where production or distribution of a product occurs. A firm is a decision-making unit that hires factors, combines them to create output and then sell the output; firms own plants. An industry is a collection of firms producing similar goods and services.

Factors of production are inputs used to produce output. They can be either fixed factors, which are factors whose quantity cannot be increased or decreased in a given time period e.g. land and machines, or variable factors, which are factors whose quantity can be changed within the given time period, e.g. labour and raw materials.

In production, a short-run time period is a time period in which there is at least one fixed factor; output can only be increased by using more variable factors. The long-run is when all factors are variable.

Typically, at small outputs, the marginal cost is high; it decreases to a minimum as output expands, and then starts increasing past that minimum. As the firm expands its output initially, it will employ more units of variable factors, causing the combination of fixed and variable factors to improve e.g. due to specialisation, raising the marginal productivity of the variable factor. Assuming the price of the variable input is constant, MC will fall. Past a certain output, the law of diminishing marginal returns takes effect, and the proportion of factors becomes less efficient, reducing the marginal productivity of the variable factor and so MC rises.

3.3 Economies of scale

The long run costs of firms are generally affected by economies and diseconomies of scale.

Dis/economies of scale are rises/falls in unit cost enjoyed by the firm or firms from growth of the firm (internal) or expansion of the entire industry (external). Internal economies or diseconomies of scale are represented by movements along the long run average cost ($LRAC$) curves of the firm, while external economies or diseconomies of scale are represented by $LRAC$ shifts.

3.3.1 Internal economies

Technical economies can lead to internal economies of scale. They occur when a firm is able to have functional specialisation of labour, allowing the efficiency of labour to increase, lowering the unit COP. Also, some inputs e.g. machines can only be employed in large indivisible units that can produce a large output, which is unsuitable for small firms, but greatly economical for larger firms. Some inputs like machines can result in greater output with a less than proportionate increase in cost e.g. a double decker bus can carry double the passengers a single decker bus can, but the cost of purchasing and operating it may not necessarily double.

Internal economies of scale can arise due to marketing economies. As a firm becomes bigger, it purchases its inputs in bulk and so may secure discounts on purchases of inputs, as suppliers are eager to get the firm's orders. A larger firm is able to spread its advertising costs over a larger output and so unit cost is reduced.

Internal economies of scale can arise due to financial economies, where they can obtain loans at lower interest rates due to greater credit worthiness; it can also issue shares to the public to raise funds in the capital market.

Internal economies of scale can arise due to risk-

bearing economies, where larger firms can deal with risks better, through diversification: if one product is not selling well, it can depend on its other products for revenue, so it is less likely to shut down than a smaller firm selling only one or two products.

Managerial economies of scale arise when firms can hire professionals in various fields to specialise and lead different departments that can help to increase a firm's output, lowering its unit cost.

3.3.2 Internal diseconomies

Internal diseconomies of scale can occur due to managerial diseconomies, which are the most common reason, as other types of diseconomies, like technical diseconomies, can simply be avoided by creating smaller plants. A firm can grow so large that it becomes difficult to manage, and more bureaucracy is involved in making decisions, slowing operations down. Paperwork can reduce work efficiency, resulting in lower productivity and thus higher unit cost. Management can find it hard to coordinate the operations of large firms, resulting in inefficiency.

Employees in a large organisation can experience feelings of alienation as the firm may become insensitive to the needs of its workers, affecting worker morale, resulting in lower productivity. An employee in a large organisation that receives a fixed salary may have little motivation to be efficient, as the quality of his work rarely translates into greater salaries.

Financial diseconomies can occur when big firs become too big and borrow too much without repaying debts, affecting the firm's credit worthiness. Banks would be reluctant to offer loans to the firm, and may begin to charge higher interest, increasing the cost of borrowing.

Risk-bearing diseconomies can occur if one branch of a firm has poor performance, which leads to negative spill over effects on other branches, increasing cost of production.

The minimum efficient scale of production is the output at the lowest point of the *LRAC*. It represents the output after which internal diseconomies will start taking effect.

3.3.3 External economies

External economies of scale can occur as when an industry expands, amenities will be developed. As firms set up in an area, the government will develop amenities for the industries, reducing costs for individual firms and facilitating production. The government will also develop a better transport network so raw materials can be transported to, and outputs away from, the firms more efficiently, reducing transport costs.

External diseconomies of scale can occur when an industry expands excessively.

The increased demand for factors of production can lead to a shortage of the factors, leading to higher prices and so higher unit cost at all levels of output.

If too many firms concentrate in one area, this can result in traffic congestion, leading to loss of man-hours as time is wasted waiting for traffic, etc. Noise, water and air pollution may also result, forcing the government to impose taxes and fines. This all leads to increased unit costs at all outputs.

3.4 Size of a firm

Various demand factors can affect the size of a firm.

If the demand for a good is small, a firm that produces that good only or similar goods with small demand will remain small simply because the market for their produces is small.

Some consumers prefer firms that are more personal with their customers, something large firms cannot as easily provide. Thus, smaller firms can usually coexist with larger ones.

Supply factors also affect the size of a firm. Some goods are naturally suited for small firms e.g. dentists, where a single dentist can only work for so many hours before his efficiency drops.

A firm will enter short run shutdown when its $AVC > AR$ or equivalently $TVC > TR$, as when this is the case, the firm would incur the least loss by producing no output. There is no such thing as long run subnormal profit, as a firm would simply exit the market.

3.5 Features of market structures

Market structure is the way in which goods and services are supplied by firms in an industry. The market structure a firm operates in will determine its behaviour, or pricing and output decision and competitive strategies, and performance, or profitability and efficiency level.

3.5.1 Barriers to entry

Some markets have barriers to entry (BTE). A barrier to entry is something that prevents the entry of new firms into an industry, thereby limiting the amount of competition faced by existing firms. There are various types of barriers to entry.

Natural barriers to entry include economies of scale and natural monopolies, among others.

Economies of scale can be a barrier to entry when the minimum efficient scale of production is large compared to market demand; firms incur huge outlays in terms of infrastructural investment and a large output is needed to produce a good at its lowest unit cost. Therefore, new small firms entering such a market would find it difficult to compete.

In the extreme case where economies of scale persist past market demand, a natural monopoly arises where the MES is so large to the extent where one firm alone

can satisfy the entire market demand, and if the demand is split equally with another firm, both firms' average costs increase to the point where they earn subnormal profits.

If a firm owns the resources needed to produce a particular good, then that firm can prevent other firms from entering the industry. E.g. Debeers owns most of the world's diamond mines and so monopolises the world's production of diamonds.

Some manufacturing industries use capital-intensive production techniques, so a large capital outlay is required to start production that may hinder entrants to the market.

State-created barriers to entry are, as in the name, created by the state.

Licenses are exclusive permits to produce owned by a firm. If a firm does not own a license to produce a controlled good, it cannot produce that good. Thus, licenses act as a barrier to entry.

Patents, copyrights and trademarks are granted by the government; they grant a firm the exclusive license to produce a good or use a specific technique for a period, in order to promote innovation. Other firms that wish to produce the same good or use the same method must pay royalties to the firm.

Firms can create barriers to entry to try to enjoy monopoly power and long-run supernormal profit.

- Advertising and brand name image creation helps to create brand loyalty in a market, making it more difficult for a newcomer to enter.
- Firms can produce many varieties of a product (product proliferation), making entry difficult.
- Firms may maintain excess productive capacity, discouraging potential entrants, as they know that incumbent firms will easily increase output to depress price when they enter.
- Firms can practice predatory pricing, which is the setting of price to levels so low that entrants are discouraged from entering the market.
- Firms can also practice limit pricing, which is when firms set prices low and restrict their profits to avoid attracting potential entrants.
- Firms can practice restrictive practices e.g. exclusive dealing arrangements with merchants that stock only that firm's products, like discounts or other favourable trading terms.

3.5.2 Price discrimation

Price discrimination occurs when a firm sells the same product to different groups of consumers at different prices for reasons not due to cost, to increase profits by reducing consumer surplus.

For price discrimination to be possible, the firm must be a price setter, markets must be separated and no resale between segmented markets should be possible, and the PED in the segmented markets must be different to enable the monopolist to charge different prices.

Firms need to be price setters as they need to be able to set different prices without losing market share completely, with their market power derived from product differentiation. The market needs to be separated with no arbitrage possible, otherwise a consumer can easily defeat price discrimination by buying from someone who has purchased the good at a lower price.

1st degree price discrimination is when the seller charges the maximum price that a consumer is willing to pay for that unit of output e.g. via an auction. This removes the entire consumer surplus.

2nd degree price discrimination is when the seller charges the same consumer different prices for different quantities sold e.g. car park charges. When a natural monopoly is regulated, it may practice two-tier pricing, where it charges some users a higher price and others a lower price, so that the monopoly can survive while also being more equitable.

3rd degree price discrimination is when the seller divides his consumers into different groups and charges a different price to each group e.g. in movie tickets or buffets. In this case, the firm produces at the point where the combined $MC = MR$; the MC is then equated to the MR of separate markets to find the output distribution between the markets.

3.5.3 Collusion

Firms can choose to collude or compete. When they collude, they can form a cartel, in which firms coordinate their activities and act as a single firm. They can also initiate price leadership, where firms follow the largest firm's prices (dominant price leadership) or use prices that best reflect market conditions (barometric).

Cartels are generally illegal in countries, and they may not last very long because of disputes and the incentive to cheat e.g. selling below the agreed price or selling more than their assigned quota.

3.5.4 Competition

When competing, firms can do so using price or non-price strategies. Price strategies are those directly related to decreasing their price, while non-price strategies are things like advertising or product proliferation.

Price competition occurs when a firm lowers its price in order to attract customers away from rivals. This can become full-fledged price wars, where firms continually lower prices until other firms are driven out of the market. This may be good, but it may also mean the firm that wins now gets to enjoy monopoly power.

Forms of non-price competition include product development and advertising. Product development differentiates a firm's products from others, and advertising

informs consumers of and persuades consumers to purchase the firm's goods, in order to increase demand for their product as well as make their product less substitutable by other firms' i.e. decrease *PED* for their product.

However, non-price competition tends to involve extra costs that may not be worth the benefit received from undertaking them.

3.6 Spectrum of market competition

- In the perfectly competitive market, there are a large number of firms selling a homogenous product. There are no BTE to the market, and there is perfect knowledge in the market i.e. producers know all costs and there are no industry secrets.
- In the monopolistic competitive market, there are a large number of firms selling differentiated products. There are little BTE to the market, but there may not be perfect knowledge.
- In the oligopolistic market, there are a few large firms, selling differentiated or homogenous products.
- Finally, in a monopoly, there is one firm selling a unique product, and there are very strong BTE.

The characteristics of market structures lead to their behaviours.

3.6.1 Market power

In markets where there are a large number of firms selling homogenous products, each firm produces a small proportion of the market output i.e. has a small market share, and so a change in any firm's output will not significantly change the market price. Thus firms in such a market, i.e. perfectly competitive market, are price takers, and have no market power, and face a perfectly price elastic demand.

Conversely, firms that sell a differentiated product or have a large market share can raise their price without losing all their customers and so they are said to have a degree of market power as they can restrict output to increase price above marginal cost. These firms face a downward-sloping demand.

3.6.2 Types of profit

In the short run, all firms can earn all kinds of profits (supernormal, normal and subnormal), but the presence of barriers to entry affects the long run profits of a firm. Firms in markets with no barriers to entry i.e. perfectly competitive or monopolistic competitive markets cannot earn supernormal or subnormal profits in the long run.

If firms are earning supernormal profits in the short run, new firms will be attracted by the supernormal profits and enter the industry. Firms earning supernormal profits will also expand and so industry output increases at all prices, therefore supply increases, leading to a fall in price, ceteris paribus. Supernormal profits will be competed away until all firms earn only normal profits.

If firms are earning subnormal profits in the short run, some firms will shut down so industry output decreases at all prices, therefore supply decreases, leading to an increase in price, ceteris paribus. Total revenue and thus profits will increase until all firms earn normal profits.

When all firms are earning normal profits, there will be no incentive for new firms to enter; existing firms stay in the industry as their revenue is sufficient to cover all their costs, and the industry is now in long run equilibrium as there is no tendency for firms to move in or out of the industry.

Firms in markets with barriers to entry i.e. oligopoly or monopoly can earn supernormal or normal profits in the long run, due to the significant barriers to entry preventing firms from entering to compete away supernormal profits. No firm will have subnormal profits in the long run as such firms will exit. Firms in markets with market power i.e. not perfectly competitive are allocative inefficient.

3.6.3 Efficiency

Assuming the firm is profit maximising, it will produce at a level where $P > MC$, so consumers value the last unit of the good more than it costs to produce it; the good is thus underproduced: increasing output can increase consumer's surplus and thus welfare. This is allocative inefficiency. There is a deadweight loss caused to society that increases with the market power a firm has.

Firms in markets with no market power are allocative efficient. In a perfectly competitive industry, the price consumers pay, which reflects the value consumers place on extra units of the good, is equal to the cost of producing the last unit of output. When $P > MC$, the value consumers place on the last unit of output is greater than the cost of producing it, so more should be consumed, and vice versa. Thus allocative efficiency occurs when $P = MC$.

Productive efficiency occurs when firms are producing a given output at the lowest possible cost i.e. they are producing on their *LRAC*. Since firms are assumed to be profit maximising, they would want to minimise costs, so they will choose the lowest cost method of production possible; therefore all firms are productive efficient.

Dynamic efficiency occurs when product and process innovation occurs. Firms that can earn supernormal profits in the long run are generally dynamic efficient, as supernormal profits provide funds for a firm to channel to funding research and development, so firms with supernormal profits are able to innovate. Such firms are usually forced to innovate to maintain their domi-

nant position in the market. Generally, the more competition a firm faces, the more they need to innovate to maintain their dominant position, so oligopolies are more dynamic efficient than monopolies.

X-inefficiency is the difference between efficient behaviour of firms assumed by theory and their observed behaviour. It occurs when efficiency is not achieved due to a lack of competitive pressure. Generally, firms experiencing more competition are less X-inefficient as they have competitive pressure to force them to keep *AC* low, and innovate to maintain their position in the market. The perfectly competitive market is completely X-efficient because if it is less cost efficient than other firms, it will make subnormal profit and be driven out of the market; firms in such a market also have no incentive to advertise as all firms make homogenous products.

Advertising is usually considered wasteful as it is an extra cost on top of what is needed to operate. In this light, the perfectly competitive and monopoly markets are not as wasteful as there is no need for them to advertise; the monopolistic competitive and oligopolistic markets tend to advertise more, and so waste more.

3.6.4 Equity

Equity is the fairness and justness of the allocation of resources.

Generally, a firm structure in which firms can earn supernormal profits in the long run is inequitable as supernormal profits go to shareholders, who generally consist of higher-income earners, worsening the income distribution as the rich get more.

However, even if a firm cannot earn supernormal profit in the long run, it does not guarantee equity as there is no guarantee that goods produced are distributed to individuals fairly, especially if the good is a necessity; those who earn higher income have the ability to purchase more, while the poor might not get enough because they do not have enough money to purchase what they need.

3.6.5 Variety

Generally, firms that sell differentiated products produce more variety and so allow consumer choice, which is a part of consumer welfare. Only the perfectly competitive market cannot have variety; in other markets, there can be a large variety of goods.

3.6.6 Mutual interdependence

Firms in market structures with few firms tend to exhibit mutual interdependence. Collusion is an extreme case of this, of course, but its effects are also seen when these firms compete, in the form of price rigidity, which is modelled using a kinked demand curve.

Two key assumptions are made in the kinked demand model, namely that if a firm lowers price, rival firms will follow suit and lower their price to avoid losing customers to the former firm; and if a firm raises price, rival firms will stay at the original price to gain customers from the former firm. These assumptions result in a demand curve that is price elastic above the equilibrium price, and price inelastic below the equilibrium price, and so there is a kink at the equilibrium price.

The corresponding *MR* curve is made from the composition of the two separate *MR* curves that the two segments of demand would separately produce, and there is a discontinuous range in the *MR* at equilibrium output; if *MC* at the equilibrium varies but stays within the discontinuous range, price will not change and so prices are rigid.

II Market Failure

4 Market Failure

The microeconomic objectives of the government are to achieve efficiency in resource allocation and promote equity in income and wealth distribution.

Market failure occurs when the price mechanism fails to allocate resources efficiently and equitably. An economy is said to be efficient if it has achieved productive efficiency and allocative efficiency.

At the economic level, productive efficiency occurs when it is impossible to make more of one good without making less of another, that is, the economy is operating on the production possibility curve, while allocative efficiency occurs when it is impossible to make someone better off without making someone worse off. In other words, it is when the right amount of the right goods are produced.

A perfectly competitive market without any externalities would achieve social efficiency.

At the firm level, productive efficiency occurs when a firm produces the maximum output for a given amount of input, or a given output at the least cost. Productive efficient firms produce on their long run average cost curves and are using the least cost combination of resources for that output level.

Allocative efficiency at the market level occurs when it produces an output where the marginal social benefit equals the marginal social cost, or in other words, where societal welfare is maximised.

The marginal social benefit (*MSB*) is the value society places on the last unit of a good that is consumed. Likewise, the marginal social cost (*MSC*) is the value of alternative goods society forgoes by producing the last unit of a good.

Similarly, the marginal private benefit (*MPB*) refers to the benefit that consumers place on the last unit of a good that is consumed, and is represented by demand. The marginal private cost (*MPC*) refers to the costs incurred by producers in producing the last unit of a good, and is represented by supply.

When there are no externalities in production or consumption, *MPC* is equal to *MSC* and *MPB* is equal to *MSB*, so the market equilibrium coincides with the socially optimal outcome.

4.1 Externalities

Private costs refer to the costs incurred by the producer or consumer. The private cost of production is usually the cost of the factors of production, like raw materials or labour. The private cost to consumers is usually the cost of purchasing a good as well as goods that are required to consume that good.

Private benefits refer to the benefit or satisfaction received by producers or consumers. The private benefit of production is the revenue received from the production and sale of a good. The private benefit to consumers is the satisfaction obtained from the consumption of a good.

An externality is a cost or benefit that affects someone not directly involved in the production or consumption of a good for which no compensation is provided.

External costs, or negative externalities, refer to costs incurred due to production or consumption of a good by people other than producers or consumers of that good, for which no compensation is provided.

External benefits, or positive externalities, refer to benefits gained due to production or consumption of a good by people other than producers or consumers of that good, for which no compensation is provided.

Social cost measures the next best alternative use of resources that are available to the whole society. It measures the total cost to society of an economic activity and thus is the sum of private cost and externalities in production.

Social benefit measures the satisfaction that society is able to obtain from being involved in a certain activity. It measures the total benefit to society of an economic activity and thus is the sum of private benefit and externalities in consumption.

On a demand and supply diagram, **(a)** the demand curve represents the private benefits of an additional unit of output produced and is thus the *MPB*; **(b)** the supply curve represents the private costs of an additional unit of output produced in the industry — it is the cost that firms take into consideration and is thus the *MPC*; **(c)** the market outcome is found at the intersection of the demand and supply curve, or the *MPB* and *MPC*, as it is where consumer and producer welfare is maximised; and **(d)** the socially optimal outcome is found at the intersection of the *MSC* and *MSB*, as it is where societal welfare is maximised.

If there are negative externalities in the *production/consumption* of a good, the *MSC*/*MPB* will be higher than the *MPC*/*MSB*. At the market output, the *MSC* exceeds the *MSB*, and the last unit's worth to society is less than what society sacrifices for its *production/consumption*. There will be an over*production/consumption* of the good, and the social cost of *producing/consuming* the excess units of the good will exceed the social benefit of that, leading to a welfare loss. Too much resources are allocated to the production of the good, thus there is allocative inefficiency, and the market fails.

If there are positive externalities in the *production/-consumption* of a good, the *MSC*/*MPB* will be lower than the *MPC*/*MSB*. For all units *produced/consumed* before the socially optimal output is reached, the *MSB* is higher than the *MSC*, so all these units should be *produced/consumed*, but the market is *producing/consuming* less than this amount, so the market is under*producing/consuming* the good. The social benefit of *producing/consuming* the under*produced/consumed* quantity is more than the social cost of doing so, thus this under*production/consumption* causes a deadweight loss. Too little resources are allocated to the production of the good; there is allocative inefficiency, and the market fails.

4.2 Information failure

Information failure arises when consumers do not get the right information or lack the relevant information on the benefits or harm that they are likely to receive from the consumption of a product.

De/merit goods are goods that the government believes consumers will consume too *many/few* units of if provided by the market due to information failure and *negative/positive* externalities in consumption.

Individuals who make decisions about how much of a *de/merit* good to consume do not fully appreciate the private *costs/benefits* that will be *incurred/received* through consuming the good, sometimes because *these benefits are in the future, uncertain or difficult to estimate accurately/they are not fully informed about the risks of consuming the demerit good*. This lack of information leads to an *over/under*estimation of the private benefits of the *de/merit* good.

De/merit goods also exhibit *negative/positive* externalities in consumption — the social benefit of consuming a merit good *is less than/exceeds* the private benefit of doing so. Consumers do not take into account external *costs/benefits* and they *over/under*estimate the private benefit of consuming a merit good, resulting in *excessive/insufficient* demand registered for the good in the market, so the *MPB* is *higher/lower* than the *MSB*.

If consumers were fully aware of the private *costs/benefits* to oneself i.e. there is perfect information, the *MPB* would be *lower/higher* than the first *MPB* but still *higher/lower* than the *MSB*. Since consumers do not take into account the external *costs/benefits* of consuming the *de/merit* good, both demand curves are *higher/lower* than the *MSB*.

(For merit good) There is an underproduction and under-

consumption of the merit good. Should the underconsumed quantity be consumed, the social benefit would exceed the social cost of doing so and societal welfare would be greater. Thus this underconsumption has led to societal welfare not being maximised i.e. there is a deadweight loss to society. Too little resources are allocated to the production of the good, thus there is allocative inefficiency, and the market fails.

(For demerit good) There is an overproduction and overconsumption of the demerit good. The social cost of consuming the excess units of the good will exceed the social benefit of that, leading to a welfare loss. Too much resources are allocated to the production of the good, thus there is allocative inefficiency, and the market fails.

4.3 Public goods

Non-excludability of a good means it is either not economically feasible or not possible to exclude anyone from using a good once it is provided. It is not possible to assign property rights to only those who pay for the good, giving rise to the free rider problem, where it is possible for a person to consume a public good without paying for it. To consumers, the possibility of being a free rider weakens the incentive for consumers to pay for the good i.e. consumers will not register their demand in the market. Since there is no expression of demand, it is impossible to charge for a public good, and if left to private enterprise, such goods will not be provided at all. There is a missing market for public goods.

Non-rivalry of a good means that the consumption of the product by one additional person does not diminish another person's ability to consume the good. This means that once the product is produced, the additional cost to allow another person to benefit from consuming the product, or the marginal cost of admitting another user, is zero. Since the socially optimal number of users occurs when $MSB = MSC$, the socially ideal price to charge each user is zero, so no public good will be supplied by the market since producers are profit motivated.

A public good is a good that exhibits the characteristics of non-excludability and non-rivalry. These characteristics result in a public good not being produced at all in a free market economy, resulting in market failure as no resources are allocated to these goods, which are usually essential and beneficial to society. There is allocative inefficiency in the market, and the market fails.

4.4 Market imperfections

Markets will operate efficiently if they operate under perfect competition, and there are no externalities. Perfect competition means that all factors of production i.e. land, labour, capital and entrepreneurship are perfectly mobile and respond perfectly to demand, enabling producers to respond efficiently to price signals, thereby maximising societal welfare.

Market dominance occurs when firms are able to set price above marginal cost to earn large profits that cannot be competed away by rivals. In this case, the market outcome will be allocative inefficient.

A perfectly competitive market would produce at the point where $D = S$ i.e. $MSB = MSC$, and societal welfare is maximised. A monopoly, however, would produce where $MC = MR$, and at this output $P > MC$. Society values the last unit of output more than it cost to produce it; societal welfare will increase if more is produced. There is an underproduction of the good; the social benefit of producing the underproduced amount is greater than the social cost of doing so, and so this underproduction causes a deadweight loss. The market is thus allocative inefficient.

Markets with strong barriers to entry are also inequitable. Firms in such markets are able to earn supernormal profits as new firms cannot enter the market to compete away profits due to the barriers to entry. Existing firms can charge higher prices and earn more profits than is economically justified, and this supernormal profit will be distributed as dividends to shareholders, who are typically high-income earners (in order to afford shares in the first place). Consumers, who may be low-income earners, may also be worse off as they have to pay higher prices to get the same good. This worsens the income distribution as the rich get richer and the poor get poorer i.e. inequity.

In reality, factors may not be perfectly mobile. There are two main types of factor immobility. Occupational immobility occurs when labour, capital or land cannot move from industry to another, due to the lack of relevant skills, or trade union restrictions (in the case of labour), or simply being unsuitable for the target industry. Geographical immobility occurs when factors of production cannot move from one location or place of employment to another, due to lack of information, resistance to change or difficulty of securing new accommodation (in the case of labour), or high costs of moving or transportation.

Occupational immobility of labour can lead to market failure.

Suppose there are changes in demand patterns. There is a decrease in demand for basic electronics and an increase in demand for pharmaceutical goods. This leads to a decrease in demand for workers in the electronics industry and an increase in demand for pharmaceutical workers. The supply of pharmaceutical workers is wage inelastic, as specialised knowledge is needed for that field. The increase in demand for pharmaceutical labour will lead to a large increase in wages, attracting the now-unemployed electronics workers, who are willing but unable to take up the jobs in the pharma-

ceutical industry, as they lack relevant skills. These unemployed electronics workers will be structurally unemployed. The higher wages in the pharmaceutical industry will cause firms in that industry to incur higher costs and hire fewer workers than if labour were fully mobile, resulting in productive inefficiency as firms are unable to utilise the least cost method of production. Since firms are unable to acquire more labour easily, they are less able to respond to price signals. There will be an underproduction and underconsumption of pharmaceuticals, as less is produced compared to if labour was fully mobile, so the right amount of the right good is not produced, and there is allocative inefficiency. Since there is both allocative and productive inefficiency, the market fails.

4.5 Inequity

Inequity refers to an allocation of resources that is considered unfair and unjust.

Income is a flow of earnings over a specified period that comes from earned income — wages — and unearned income, which is income received from savings and shares.

There is generally always income inequality in the real world, which results in inequity. The demand for skilled labour is generally higher than that of unskilled labour, as the former tends to have higher labour productivity. Conversely, the supply for skilled labour is generally lower than that of unskilled labour, as the former requires specialised technical skills that are not easily acquired. A combination of high demand and low supply for skilled workers leads to high wages and thus high income for skilled workers, while the reverse holds true for unskilled workers. There is thus income inequality between skilled and unskilled workers. Due to occupational immobility, unskilled workers cannot move into the skilled labour market as they simply lack the skills required; they are thus unable to earn the higher wages that skilled labour do. Unequal incomes persist, leading to income inequality. The presence of trade unions can also lead to income inequality, as workers that are members of large trade unions will be able to earn higher wages than non-unionised workers do due to the collective bargaining power possessed by large unions.

Income inequality results in inequity. In a market-based economy, allocation of resources is based on the price mechanism. An increase in demand for a good causes an increase in prices, and producers respond to this by increasing production (and thus supply). The goods produced are distributed among those who are willing and able to pay. Individuals who are unable to pay will not have access to goods and will be rationed out of the market, and so in a market based economy, the types and amount of goods produced is based on the willingness and ability to pay, rather than on needs. If income is unevenly distributed, those with more income will be able to affect what and how much goods are produced, as they can cast more dollar votes for the goods they want. Resources will be allocated more to produce luxury goods for the rich, while the needs of the poor will not be fulfilled. The rich will be able to enjoy more goods and services compared to the poor as they can demand more goods and services, having more dollar votes, so more resources are allocated to production of goods and services for the rich. There is thus unfair distribution of resources as the rich have access to more necessities than the poor do, and thus the market outcome is inequitable. The market fails.

5 Government Intervention

5.1 Indirect taxes

An indirect tax is a solution to correct negative externalities in production and in consumption, and demerit goods. Indirect taxes are compulsory payments made to the government for the provision of goods and services. The amount of tax to impose should be equal to the *MEC* at the socially optimal output.

The tax will cause producers to internalise the external costs by making producers pay for the external cost generated. This will increase the unit cost of supplying a good. There is now less potential profit for each unit of output produced. Supply falls, and the market reaches a new equilibrium where the output is reduced, possibly to the socially optimal level. If the output is equal to the socially optimal level, deadweight loss is eliminated and societal welfare is maximised, so the market is now allocative efficient.

If there is an undertax, the output will still be higher than the socially optimal level, but deadweight loss is still reduced, and societal welfare increases. If there is an overtax by an amount smaller than the MEC/IF, output will be lower than the socially optimal level, but deadweight loss is still reduced. If there is an overtax by an amount greater than the MEC/IF, output will be lower than the socially optimal level, but deadweight loss is increased instead.

Indirect taxes have their advantages and disadvantages.

Indirect taxes are market-based and so are easily implemented without excessive government monitoring compared to other measures like legislation. It has greater flexibility and fairness compared to legislation as the amount of taxes can be varied to reflect the size of the external cost. Indirect taxes bring in revenue for the government that can be allocated for other uses, like compensating third parties affected by the negative externality in production.

Indirect taxes give firms an advantage to develop cleaner technologies, as a cleaner technology reduces the amount of tax a firm has to pay.

However, successful taxation depends on the accuracy of measuring the exact value of the external costs, which is typically difficult as external costs may be difficult to monetise, especially if external costs cross national boundaries (like pollution) or affect third parties that are affected by a multitude of other factors, like farmers. In other words, taxes are susceptible to government information failure.

If the demand for a good is price inelastic, the value of the tax will be high in order to reduce the output to the socially optimal level. This may lead to illegal activities, like tax evasion or a black market, as people make underground transactions to avoid taxes.

Indirect taxes may lead to inequity if applied to necessities like energy, as a blanket tax will affect everyone, whether rich or poor, and so will generally have a greater impact on the poor.

5.2 Carbon permits

Tradable carbon permits are a solution to correct negative externalities in production of energy. They are rights to produce carbon issued by the government to limit the amount of pollution that firms can discharge, as production activities are usually the major source of carbon emissions.

Tradable permits operate on a cap and trade principle, where firms purchase a permit for every tonne of carbon emitted. The government caps the overall emissions at what it considers the socially ideal level of pollution and the market decides on the price to allocate the permits among firms. Firms that can reduce emissions cheaply will have an incentive to reduce emissions and sell excess permits to firms that cannot do so. Firms that cannot reduce emissions cheaply may find it cheaper to purchase permits from other firms, assuming that the penalty of exceeding their allowed amount of pollution is greater than the cost of purchasing permits. The costs of the permits will add on to a firm's *MPC* and so firms internalise the external costs. The unit cost of production increases, and there is less potential profit for each unit produced, so *MPC* falls and is closer/equal to the *MSC*, reducing the deadweight loss.

Low-polluting firms may gain a competitive advantage and drive some high-polluting firms out of business, further reducing the external cost by reducing the amount of emissions overall.

Tradable carbon permits have their advantages and disadvantages, mostly similar to those of taxes.

5.3 Research and development

Research and development subsidies are a solution to negative externalities in production.

Governments subsidise firms' investments into developing better methods of production. If research is successful, the external cost decreases or is possibly eliminated, reducing deadweight loss and reducing or solving the market failure.

Research and development has its advantages and disadvantages.

R&D does not have any effect on firms' profits, so greater investments are encouraged. Furthermore, if R&D is successful, firms will enjoy a lower unit cost of production, improving the price competitiveness of their goods.

However, R&D can be costly, as funds and manpower needs to be redirected to perform R&D. R&D is also uncertain and may not result in any positive outcome, wasting any resources used.

5.4 Legislation

Legislation is a solution to correct both negative and positive externalities and merit and demerit goods. They are rules and regulations that individuals and firms must comply with, or face penalties.

If there is an overconsumption or overproduction, a legislation can, for example, reduce demand by making it illegal for minors to purchase the good (in the case of alcohol), or reduce supply by setting laws that limit the amount of pollution firms can generate (in the case of energy). If there is an underconsumption or underproduction, a law can, for example, increase demand by making it mandatory for the good to be consumed, like in the case of vaccinations or education. Should individuals or firms violate these laws, they will face punitive measures; the government will have to monitor to ensure that they are obeying the laws.

Legislation has its advantages and disadvantages.

Legislation is generally easier to devise compared to market-based solutions, as it does not require much market data to decide, for example, how much tax to impose.

Laws, however, require monitoring and enforcement for them to be effective, which can be very costly, requiring a lot of manpower which involves a high opportunity cost. The punishments also need to be severe enough for measures to be effective. Laws are also considered a blunt instrument, as they are not sensitive and usually not customised to the individual needs and circumstances of firms and customers. In many cases, the implementation of laws involves bureaucracy, which can dramatically slow down the process.

5.5 Indirect subsidies

Indirect subsidies are a solution to correct positive externalities, merit goods and inequity. Subsidies are compulsory payments *by* the government to firms for the production of goods and services.

A subsidy will lower the unit cost of production of supplying a good to the market, resulting in a higher potential profit per unit. Supply increases, possibly

to the *MSC*. Deadweight loss is reduced or eliminated, reducing or correcting the market failure.

Some subsidies can be given out in the form of means-tested benefits, where the subsidies are only given to people that can prove that their income is below a certain level, to correct inequity.

Indirect subsidies have similar advantages and disadvantages to taxes, where applicable.

However, instead of bringing in revenue, they require government spending. This means that funds need to be directed away from other uses, like education or infrastructure development, in order to provide the subsidy; there is opportunity cost in doing so, and if the cost is higher than the benefits of doing so, the government fails.

Subsidies also tend to increase equity instead of bringing about inequity (unlike indirect taxes), as they lower the price of goods, allowing the poor easier access to them; if the good is a necessity, it helps to increase equity.

5.6 Direct provision

Direct provision is a solution to correct positive externalities, merit goods as well as public goods. Direct provision can be seen as a full subsidy, reducing the *MPC* curve to zero at all prices. Direct provision is simply the government providing a good itself at no cost to consumers.

Direct provision has similar advantages and disadvantages to subsidies. However, it also has the problem of possibly leading to overconsumption (since it is free), and may lead to the problems incurred by increasing direct taxes like personal income tax, if income tax has to be raised to fund direct provision.

5.7 Provision of information

Provision of information or public education is a solution to correct information failure in merit and demerit goods. It is the government educating the public through mass media, carrying out campaigns to show citizens the importance or detriments of the merit or demerit good (respectively).

By educating the public, individuals will be more aware of the benefits or cost to themselves, and the *MPB* will increase or decrease accordingly, correcting information failure and reducing the deadweight loss, helping to slightly alleviate the extent of market failure.

Public education is effective mainly in addressing information failure.

It is good because it targets the root cause of the problem — simply that citizens are unaware.

However, it tends to be costly as resources need to be dedicated to designing campaigns and advertisements, which requires government spending, and so it brings about all the possible risks related to government spending and opportunity cost. Coupled with the fact that public education is uncertain — citizens may simply ignore campaigns — it may not be a very suitable measure if the extent of market failure is very serious.

5.8 Measures against factor immobility

Education and training is the primary method to correct occupational immobility of labour; it also corrects inequity. It involves governments giving subsidies and tax rebates to firms for them to provide training and upgrading of skills for their workers; personal income tax rebates are also given to workers themselves if they seek training.

Workers acquire relevant or new skills and then are able to move to new jobs should demand patterns change, reducing occupational immobility. Labour supply becomes more wage elastic. Since the problem of labour immobility is reduced or solved, the problem of productive and allocative inefficiency also reduced or solved. Analyse accordingly.

Education and training has its advantages and disadvantages.

It is good as it addresses the root cause of occupational immobility.

However, it is costly as it involves the loss of output and thus revenue of firms, when workers are unable to work, as they have to attend training. The government subsidy involves the same risks associated with government spending. Education and training is also uncertain and workers who are unreceptive during training will simply waste the funds spent on them. Training will take a long time to show its results, as it needs time.

Other methods of reducing occupational immobility of labour include career fairs, where the government provides information on opportunities mainly for unemployed persons to find jobs. This is done through job fairs and job banks. This helps to reduce unemployment, reducing inefficiency.

To reduce geographical immobility, the government can improve and reduce the cost of using transportation systems, so that labour can easily move from one place to another to work. The government can also provide help in relocation and moving households when workers need to move to other places in order to gain employment. These measures are costly.

5.9 Progressive direct taxes

Progressive taxes are taxes whereby the average rate of taxation increases as income increases. A progressive personal income tax is a tax where those with higher income pay a larger proportion of their income to the government, and vice versa.

Such a tax generally is used to redistribute resources from the high-income earners to the lower-income earners: income taxes reduce individuals' disposable in-

come and thus purchasing power, and since those with higher income are taxed more than those with lower income do, the gap in disposable income is generally reduced, allowing for a more equal distribution of income. This reduced income gap reduces the gap in the ability of the rich and the poor to cast dollar votes; the poor will have a more equal chance to consume necessities, reducing inequity.

Progressive income taxes have their benefits and drawbacks.

They may act as a disincentive to work as reducing a worker's disposable income reduces the opportunity cost of leisure. An extra hour of leisure taken involves a smaller sacrifice in income and thus in consumption; since the rich are more likely to put a higher premium on leisure, they may choose to work less if a lot of their income is taxed, reducing labour productivity.

Also, the rich and highly skilled workers tend to be internationally mobile. If a country has high income taxes, they may choose to move to somewhere that has lower income taxes to work, potentially resulting in a 'brain drain' where a large number of skilled workers leave the country, reducing labour productivity.

5.10 Price controls

Price controls are a blunt method to correct inequity. A price ceiling is a limit on the highest price that a producer can charge legally, while a price floor is a limit on the lowest price that a producer can charge legally.

A price ceiling on necessities means that the price can be limited to a value that the poor can afford, so that they can purchase necessities, reducing inequity.

Price ceilings generally lead to permanent shortages if below the equilibrium price; price floors generally lead to permanent surpluses if above the equilibrium price. Otherwise, they are completely ineffective.

Price controls have their benefits and drawbacks.

A price ceiling leads to a shortage, where demand cannot be met by supply. Some method will need to be used to ration the limited supply to customers, which could involve biases or high administration costs. An illegal black market may also form, where suppliers sell at higher prices; customers may also be prepared to pay higher prices to ensure they can get the good, defeating the point of the price ceiling.

A price floor leads to a surplus. Some method needs to be used to deal with the excess supply. The government may choose to purchase all the excess supply, but this is costly. It may also lead to a black market where suppliers sell below the price floor, defeating the point of the price floor. In terms of minimum wage laws, a price floor will lead to unemployment, worsening inequality.

5.11 Measures against market dominance

5.11.1 Taxation

Various types of taxes can be used to control monopolies or other firms with large market power.

A profit tax is a tax on profit, and it does not affect cost, so the firm's equilibrium stays the same.

A lump-sum tax is a fixed sum tax imposed regardless of output. It is a fixed cost and so will not affect the firm's MC (and by extension, output), but it will increase AC.

A unit tax is simply the same as the indirect tax as above. It will increase both MC and AC curves and so it generally decreases output.

Taxes that do not change the market outcome generally do not affect allocative inefficiency, but by decreasing supernormal profits, they improve equity. However, since variable taxes further reduce output, they actually worsen allocative inefficiency. Taxes in general result in lower dynamic efficiency as firms have less incentive to innovate; lower costs that lead to higher profits would simply be taxed away.

5.11.2 Legislation

Legislation can also be used to control monopolies or firms with large market power.

Laws can be set that restrict the market concentration ratio in order to reduce market shares and reduce market power possessed by firms. Laws can also be set to control the price of monopolies e.g. forcing all price changes to be approved by the government, to ensure that the consumer surplus is being maintained, or a price ceiling can be set such that quantity at the price ceiling is equal to or closer to the socially optimal output.

Competition policies can be set in place to prevent anticompetitive behaviour, like mergers that result in overly large firms that have too much market power as considered by the government.

Policies to control firms are generally difficult to implement as they can alienate firms; policymakers may also lack the technical knowledge to fairly decide what should be done. Generally, these policies reduce market power, making the firm more allocative efficient and more equitable. The usual problems with laws apply.

Governments can also regulate natural monopolies using AC- or MC-pricing, which is simply forcing the firm to set price at AC or MC respectively. Generally, this reduces or eliminates allocative inefficiency as the firm's output increases closer to P = MC; inequity also decreases as supernormal profits decrease, so consumer surplus increases. However, MC-pricing very often leads to a subnormal profit, so it is usually not viable as no firm can exist in the long run if MC-pricing is forced on such a market.

Two-tier pricing can be used, where consumers pay a standard charge that covers the fixed cost, and then a marginal charge that covers the variable cost depending on how much they use. Each consumer will pay a fixed charge, equal to the difference between average cost and marginal cost at the equilibrium, and a marginal charge equal to the marginal cost at equilibrium for each unit.

For natural monopolies, the state can take over production of the good to protect the interests of consumers. Since states are not profit-motivated, they will produce at levels that are socially optimal; any profits made can be passed onto the country in the form of tax reliefs or lower prices. However, state-owned enterprises may be bureaucratic or unresponsive to consumers' wishes. They will also likely be a tax burden as they do not charge profit-maximising prices and so they may earn subnormal profits, which will be made up using taxes.

The theory of contestable markets suggests, however, that there is no need for governments to intervene, as market power of producers can be constrained by potential competition, forcing firms to keep prices closer to marginal cost and reduce profits because barriers to entry are low, so the monopoly may not be that allocative inefficient or inequitable. Monopolies in contestable markets may benefit consumers more than firms operating in a perfectly competitive market as monopolies can enjoy economies of scale, and the threat of potential competition will ensure that the firms act competitively to keep profits and thus prices low.

5.12 Government failure

Government intervention can sometimes result in the society being worse off. This is known as government failure.

For example, if the government experiences information failure when estimating the extent of the market failure or external cost/benefit etc., and overcorrects by a large extent, it may worsen the situation. If the form of intervention involves government funding, that funding may be wasted if the government overcorrects.

Governments usually involve a lot of bureaucracy, which leads to time lag, as time is needed to do administrative work, pass any bills in parliament, et cetera. By the time intervention takes effect, circumstances may have changed, requiring different measures.

Government intervention can also result in disincentive effects, e.g. reducing the incentive to work, or creating a black market, like detailed above.

Politicians may sometimes do the things that ensure they will win the next election, instead of what would be economically the best course of action, which may lead to a less than optimal use of resources.

III The Macroeconomy

6 Macroeconomic Principles

6.1 Macroeconomic aims

Governments generally have four macroeconomic aims.

Governments aim for high and sustained economic growth as it leads to a higher material standard of living for their citizens, a reduction in unemployment, an increase in tax revenue, and a fall in government expenditure on things like unemployment benefits as unemployment falls. Stable economic growth also boosts individuals' and firms' confidence, encouraging further consumption and investment.

Governments aim for low and stable inflation — typically 2 %–3 % — as high or uncertain inflation adversely affects investment, production, employment and economic growth. It will also distort the price mechanism, leading to allocative inefficiency. If domestic inflation is higher than competing countries, the country's export competitiveness will be impacted.

Governments aim for full employment (i.e. no disequilibrium unemployment) as unemployment signifies a waste of resources: the economy is not producing at its full capacity. Unemployment means lower output and income and thus a lower standard of living for the economy; it also means less tax revenue as the unemployed do not pay income tax — and worse, the government may have to pay unemployment benefits.

Governments aim for a balance of payments equilibrium (or a small surplus) as a long term, persistent and unplanned deficit indicates a fundamental problem in the economy: that the country is living beyond its means. The government will have to draw on its foreign reserves to make up the shortfall, and these reserves will eventually deplete, after which the government will have to borrow from abroad, leading to long term debt, impacting the standard of living of future generations.

6.2 Circular Flow of Income

The circular flow of income shows the flow of payments for goods and services around the economy. Typically, a 4-sector economy is used, encompassing households, firms, the government, and the foreign sector.

The main role of households is to supply factors of production they own i.e. labour in return for factor payments. Conversely, firms supply goods and services to households. Thus household expenditure forms firm income, and firm expenditure forms household income.

An injection (J) is an addition to the circular flow which does not come from household expenditure; it is

mainly formed by investments (I), government spending (G) and export revenue (X). A withdrawal (W) is any part of income that is not passed on within the circular flow of income; it is mainly formed by savings (S), taxes (T) and import expenditure (M).

In an economy at equilibrium, the value of injections equals the value of withdrawals i.e. $J = W$. When there is an increase in injections or withdrawals, the multiplier effect takes place.

6.2.1 Multiplier process

Assume we have a 4-sector economy that is initially at equilibrium, where injections equals withdrawals, the marginal propensity to withdraw is 0.1, and that the economy has spare capacity.

An injection into the economy of \$1m will cause firms to respond to this increase by using more labour and raw materials to produce more goods, paying more factor incomes to households. The income of households supplying factors of production increases by \$1m, and national income increases by \$1m.

Since the marginal propensity to withdraw is 0.1, households supplying factors of production will spend \$0.9m on food, clothing, recreation, medical care, and the like, and withdraw \$0.1m as savings, taxes, and import expenditure. This increase in spending by households causes firms to use more labour and raw materials to produce more output in the food, clothing, recreation, medical care, etc. industries, and households supplying factors of production in those industries will receive an income of \$0.9m.

This second group of recipients will spend \$0.81m on goods and services and withdraw the remaining \$0.09m. This process continues, with each new round of spending being 0.9 of the previous. A long chain of extra income, household spending, employment and withdrawal is created. Each round of household spending becomes smaller as each time money circulates, some of it is withdrawn. Eventually, when the injection of \$1m has leaked out as withdrawals, and the increase in withdrawals equals the increase in injections, the multiplier process ceases and there is no further change in national income. A new equilibrium is reached.

National income will increase by a multiplied amount, with the multiplier $k = 1/MPW = 10$, so the total increase in national income is $10 \times$ \$1m, or \$10m.

6.2.2 Multiplier

There are various factors affecting the multiplier k, which is the reciprocal of the marginal propensity to withdraw. Clearly, if households spend less in the domestic economy, there will be a smaller multiplier effect. In other words, any change in national income will propagate through the circular flow until the initial increase in income leaks away from the inner flow as withdrawals.

The marginal propensity to withdraw is composed of the marginal propensity to save MPS, marginal rate of taxation MRT, and marginal propensity to import MPM:

$$MPW = MPS + MRT + MPM$$

Each component depends on several factors.

The marginal propensity to save depends on a country's distribution of income and availability of welfare, whether the country has compulsory savings, and even on the culture of the people. In Singapore, the MPS is high because of our CPF scheme, which forces us to save. An unequal distribution of income in Singapore also leads to higher MPS as the higher income tend to save more. Obviously, the lack of a welfare system in Singapore also contributes to our high MPS.

The marginal rate of taxation depends (quite obviously) on the tax rates.

The marginal propensity to import depends mostly on the national income of a country, its factor endowment and its openness to international trade. Singapore has a high MPM, given that it is a small and open economy. Singapore also lacks natural resources, forcing it to import many of the consumer goods and raw materials from overseas. Its generally higher national income also means that its population is willing and able to spend on imports.

6.3 Aggregate demand and aggregate supply

Aggregate supply (AS) is the total output that firms in an economy are willing and able to supply at different price levels in a given period of time. The aggregate supply curve is generally perfectly elastic at low levels of output, upward sloping over a small range, and then perfectly inelastic. This is because the economy in the long run can operate at any level of output that is not necessarily at full capacity.

The AS curve will shift to the right if there is an increase in the productive capacity of the economy, in the quantity and/or quality of resources, or an improvement in technology.

Aggregate demand (AD) is the total spending on an economy's products at different general price levels in a given time period, measured in real terms. It consists of consumption, investment, government spending, and net exports i.e.

$$AD = C + I + G + (X - M)$$

When components of AD increase, AD increases, and vice versa.

Consumption C generally increases when there is an increase in income or wealth, as the purchasing power of individuals increases, or a fall in interest rate, as individuals become more willing and able to borrow to purchase expensive items.

Investment I generally increases when there is a decrease in interest rate, as projects with lower expected

returns become profitable, since the cost of borrowing is less, so more investment occurs. I is also affected by business confidence: when businesses are optimistic, I is usually higher, and vice versa.

Government expenditure G depends on what government policies have been set in place.

Export revenue X and import expenditure M are both affected by exchange rates of the domestic currency. When the domestic currency appreciates, X falls (assuming $PED_x > 0$) and M (assuming $PED_m > 1$) increases as exports become more expensive in foreign currency, so overseas consumers switch their consumption to alternative, cheaper countries, while imports become cheaper in domestic currency and so domestic buyers switch from more expensive domestically-produced products to cheaper imports.

6.3.1 Adjustment process

The value of aggregate demand at a given price level is the total spending, while that of aggregate supply is total output. The economy is at equilibrium when total spending equals total supply.

If total spending is less than total output, there is a surplus in the economy. Goods remain unsold and inventories accumulate, so firms lower production. If the economy is near full employment, there will be less competition for goods and factor prices fall, leading to a fall in general price level. Total spending rises while total output falls until they are equal, and real output thus falls.

If total spending is more than total output, there is a shortage in the economy. Inventories deplete and firms increase output to meet demand. If the economy is near full employment, there will be more competition for goods and so firms bid up factor prices, and general price level rises. Total spending falls while total output rises until they are equal, and real output thus increases.

If there is a shortage when the economy is at full employment, firms bid up factor prices and general price level increases until total spending equals total output, but total output does not change.

If there is a shortage when the economy has spare capacity, unused resources are simply hired at the same costs, there being no competition for resources, so there is no change in price level.

6.4 Macroeconomic indicators

6.4.1 GDP and GNP

National income statistics indicate how much is being produced in an economy. Of course, the more the economy produces, the better its performance.

Gross domestic product (GDP) is the monetary value of final goods and services produced within a country over a year.

Gross national product (GNP) is the monetary value of final goods and services produced with the resources of a country over a year. Net national product (NNP) is GNP with depreciation deducted.

Real income (GDP or GNP) is simply income adjusted for inflation.

NNP is the most accurate measure of national income. However, countries typically use GNP as it is difficult to accurately determine the value of depreciation.

National income statistics can be used to compare standard of living of a country at two instants in time, or between countries. When this is done, we typically use real GDP or GNP per capita, which is simply GDP/GNP divided by the number of residents. An increase in GDP or GNP per capita indicates generally an increase in standard of living of residents.

When comparing across countries, we may use a purchasing power parity (PPP) exchange rate, in order to account for differences in the price levels and prices of common items and necessities. A PPP exchange rate is a rate of exchange that would allow a given amount of money in one country to buy the same amount of goods in another country after exchanging it into the currency of that other country.

Limitations of GDP and GNP

While GDP and GNP can give an indication of the standard of living of countries, it is not entirely accurate. We categorise problems into measurement problems and usage problems i.e. problems about the accuracy of GDP and GNP, and problems about what they do not even measure.

GDP or GNP per capita may be inaccurate simply due to the information gathered being inaccurate e.g. in developing countries with low levels of accuracy, the people may not be able to declare their income accurately in tax forms, understating the actual output produced by the economy.

They also do not take into account non-marketed goods and services, especially goods produced that are not traded, like voluntary work and goods produced for oneself, and goods produced that are exchanged without money i.e. barter trade. This makes the GDP and GNP an understatement of the well-being of the society.

If economic activities are illegal e.g. because they were done in a black market, they will not be reported either. If the black economy has been growing at a significant rate, it may mean income statistics understate the increase in material well-being of consumers. Also, people may not declare income because they wish to avoid paying tax.

Even if GDP and GNP are accurate, they do not give any indication about the income distribution. Thus an increase in income per capita does not mean everyone

in the country is better off, as the income distribution in the country may be very bad. If data like the Gini coefficient is considered along with GDP and GNP, it may give a better account of how an increase in real income is distributed among the population.

GDP and GNP do not consider the type and quality of products and how much they actually increase the well-being of the people. Typically, goods that increase well-being include necessities like housing, food and clothing. During a war, for example, income could increase due to an increase in production of weapons, but no one will say their well-being has increased. Also, the quality of products has generally increased over time especially as technology has improved, but this is not reflected in income either.

Income statistics also do not at all consider the non-material welfare of individuals i.e. quality of life. Quality of life considers factors like a person's environment, crime rates of a country, security, life expectancy, healthcare, quality of leisure and even happiness. For example, an increase in real income per capita in a country may overstate the increase in standard of living if the increase in income is because people are working longer, leading to more stress and less quality leisure time.

When using GDP and GNP to compare standard of living across countries, there are more problems that arise.

Even if a country has a higher real income per capita compared to another country, comparing using a common currency, it does not mean the former country's citizens have a better standard of living, because the price levels or cost of living in the first country may simply be higher. This can be accounted for by using a PPP exchange rate.

Also, the reliability of data often differs across countries. Income data from developing countries may be inaccurate due to lack of facilities for and expertise in data collection, which makes it difficult to compare standard of living between developing and developed countries — the standard of living of a developing country may not be as bad as their income data makes it seem.

The size of black markets and the amount of goods produced that are not exchanged in a legal market also differs. Some countries may have larger black markets due to laws like price ceilings while other countries may have significant amounts of output not reported because of e.g. subsistence farming. Even housework is considered a service that, if done by the houseowner, will not be reported. When comparing the standard of living between developing and developed countries, this poses a problem, as a large part of agricultural production in developing countries is not traded — subsistence farming — and so is not accounted for in income; thus income will underestimate the country's output and thus standard of living.

Similar to before, the income distribution between the two countries can also differ, which means income will not be a good indicator of the standard of living. For example, if one country has a relatively fairer income distribution but a lower income per capita, that country will have a higher standard of living overall than a country that has an unfair income distribution but a higher income per capita — it simply means a few rich people have a lot of income, while the rest of the country is poor, but income per capita alone cannot indicate that.

Also, the types of goods produced across countries differ. Even if one country has a higher income per capita than another, if the former country produces goods like weapons that do not really improve standard of living, while the latter country has a large agricultural sector, then the latter country will have a better standard of living, even though the income per capita says otherwise.

The quality of life between countries also differ. A country may have a high income per capita but the people of the country might also be overworked and stressed, and their quality of life will be much lower than another country that might have a lower income per capita but a happier population. In this case, income per capita will overstate how much higher the standard of living of the former country is compared to the latter country.

6.4.2 Other indicators

The Gini coefficient is a measure of the extent to which the distribution of income among households deviates from a perfectly equal income distribution; zero indicates complete equality and one indicates complete inequality.

The Measurable Economic Welfare (MEW) is an adjusted GDP figure that factors in quality of life. Things that improve quality of life add to the GDP while things that reduce quality of life subtract from GDP.

The Human Development Index (HDI) is a composite indicator measuring many things, including GDP per capita in PPP$, life expectancy at birth, literacy rate and school enrolment. The HDI ranges from 0 to 1 where 0 is the lowest and 1 is the best possible score. Empirical evidence indicates that countries like Canada have a higher HDI than income per capita indicates, and countries like Singapore have a lower HDI than income per capita indicates. Critics point out that the HDI do not take into account issues like freedom, human rights, protection from violence and discrimination.

6.5 Income-AE model

Aggregate expenditure AE is the total planned expenditure on all final goods and services in an economy

over a period of time. It is the sum of consumption C, investment I, government expenditure G and net exports $X - M$.

The difference between AE and AD is that AE deals with nominal values whereas AD deals with real values (which is why AD deals with price levels). Just like AD, AE varies with the level of national income: when people have more income, they will tend to spend more.

The economy is at equilibrium when the aggregate expenditure is equal to the total income or output i.e.

$$Y = AE$$

On a graph of planned expenditure against national income, this equilibrium is represented by the point of intersection between the $Y = AE$ line and the line representing AE at various income levels.

If there is a change in national income, then there is a movement along the AE curve. If there is a shift of AE due to **(a)** a change in autonomous consumption e.g. due to a change in preferences; **(b)** a change in investment expenditure e.g. due to a change in interest rate; **(c)** a change in government expenditure e.g. due to changes in policy; or **(d)** a change in net export expenditure e.g. due to changes in exchange rate, then the multiplier process takes place.

6.5.1 Adjustment and multiplier process

(This is in addition to the multiplier process in section 6.2.1.)

Suppose a firm invests in building a new office, costing \$10m. This is an injection of \$10m into the economy, causing a shift of AE from AE_1 to AE_2. At the current planned output Y_1, $AE > Y$, and there will be unplanned rundown of inventories by AB. Firms respond by hiring more factors of production of value equal to the injection i.e. \$10m, so planned output rises by the same amount to Y_2, and the economy moves from B to C.

Households supplying factors of production to these firms receive an additional income of \$10m, and assuming an MPW of 0.1, they spend \$9m on domestic goods and services, and so at Y_2 planned expenditure exceeds planned output by CD i.e. \$9m and there is further unplanned rundown of stocks by that amount. Firms hire more factors of production of value equal to \$9m and income increases to Y_3, seen as a movement from D to E. At Y_3, planned expenditure still exceeds planned output by EF and there is unplanned rundown of stocks by \$8.1m. Firms again hire more factors of production, and the cycle repeats until a new equilibrium is reached at Y_5 where planned expenditure equals planned output. At this new equilibrium, the change in income is a multiplied value of the injection that caused the adjustment, with the multiplier as discussed in section 6.2.1.

7 International Trade

International trade refers to the exchange of goods and services between countries.

7.1 Theories explaining trade

7.1.1 Theory of comparative advantage

The theory of comparative advantage states that trade can benefit countries involved if **(a)** they specialise in producing and trading those goods in which they have a comparative advantage; and **(b)** the terms of trade lies between the domestic opportunity cost ratios of the two countries.

A country is said to have comparative advantage in the production of a good when it can produce that good at a lower opportunity cost than another country; it reflects the country's factor endowment.

To illustrate the theory of comparative advantage, we assume that **(a)** there are two countries A and B that produce rice and cloth; **(b)** resources within the country are fully mobile; **(c)** there are constant costs in both industries; **(d)** there is full employment; **(e)** there is no transport cost; **(f)** there are no barriers to trade; and **(g)** each country has a given amount of resources.

Suppose that in the absence of trade, both A and B devote half their resources to each product. The output produced for each product in each country before specialisation is given below.

Country	Cloth	Rice
A	30	15
B	5	10
Total	35	25

It can be seen that A has comparative advantage in cloth production, as the opportunity cost of producing a unit of cloth in A is 0.5 units of rice, while that in B is 2 units of rice. On the other hand, B has comparative advantage in rice production, as the opportunity cost of producing a unit of rice in A is 2 units of cloth, while that in B is 0.5 units of cloth.

These differences in comparative advantage form the basis of specialisation and trade. Consider the case where the countries specialise in the production of the commodity in which they have a comparative advantage in. Suppose that A devotes two-thirds of its resources to cloth production and one-third to rice production while B fully specialises in rice. The production aftter specialisation is given below.

Country	Cloth	Rice
A	40	10
B	0	20
Total	40	30

In A, the opportunity cost of producing one unit of cloth is half a unit of rice. For A to gain from trade A must receive more than half a unit of rice for each unit

of cloth. Similarly, B will not offer more than 2 units of rice per unit of cloth. The terms of trade will thus be between the opportunity cost ratios of A and B i.e. between half to two units of rice per unit of cloth.

Assume that the countries decide to trade one unit of rice for one unit of cloth, and they trade 8 units of rice for 8 units of cloth. The consumption of both countries is shown below.

Country	Cloth	Rice
A	32	18
B	8	12
Total	40	30

It can be seen that **(a)** the world output of rice and cloth has increased by 5 units each; and **(b)** both countries have increased their consumption of both rice and cloth, and so the material well-being of the people in A and B has increased. Trade is thus mutually beneficial for both country A and B.

Limitations

The theory of comparative advantage makes some assumptions that are unrealistic in real life.

It assumes that there are constant cost conditions i.e. as a country produces more for export, the average costs of production stay the same. This is untrue in reality and diseconomies of scale may occur, resulting in lower gains from trade. Countries will still benefit from trade, but they will not specialise to the extent the theory suggests they will.

Also, the theory assumes factor mobility, which is of course untrue in reality. As a country specialises in the production of a good, it may end up having to use labour that is less suitable in terms of skill for the production of the good, putting a constraint on the possible increase in output level with specialisation, and thus the gains from trade.

There are also transport costs involved when trading, especially when trading with countries that are far away. This reduces the comparative advantage of a country as countries that import from that country will consider the cost of transporting goods from that country in addition to the price of the goods.

Finally, in the real world, there also exist trade barriers that reduce the volume of trade.

7.1.2 Other explanations for trade

The theory of comparative advantage uses cost difference as a reason for trade. However, there are other reasons.

Differences in demand can be a reason to trade. Suppose there are two countries A and B that both produce meat and vegetables equally efficiently, but A has more meat-eaters while B has more vegetarians. If A and B do not trade, meat will be relatively more expensive in A while vegetables will be relatively more expensive in B. Trade between the countries will reduce the price of meat in A and price of vegetables in B, and will also increase the incomes of meat farmers in B and of vegetable farmers in A.

Another reason could be seasonal produces, like fruits. Suppose a country A produces strawberries, and has relatively constant demand for strawberries throughout the year. When A's strawberries are off-season, demand is relatively higher than supply, so A imports strawberries from overseas. When A's strawberries are in season, demand is relatively lower than supply, so A exports strawberries.

7.2 Benefits of trade

The main benefit from trade is the gain in welfare. It can be shown that when a country imports a good at a price lower than its domestic market price, the consumer surplus increases while the producer surplus decreases, and the increase in the former is more than the decrease in the latter such that there is a net increase in welfare.

Trade also allows people to have more choices in terms of the branding or variety of products. Overall, the availability of products at cheaper prices and more choices leads to higher material well-being and thus standard of living.

Trade can also allow a country to enjoy economies of scale as it is producing for a larger international market, allowing industries to produce at lower unit costs, which will be passed on to consumers as lower prices.

Competition from imports can also stimulate greater research and force firms to be more efficient, lowering prices and making better quality products.

The disadvantages of trade are largely similar to those of globalisation.

7.3 Protectionism

Protectionism is a deliberate government policy to erect trade barriers in order to shield domestic industries from foreign competition. It aims to switch expenditure, both domestic and foreign, to the output of goods and services of the domestic economy.

7.3.1 Tariffs

A tariff is a tax on imports. When imposed, a tariff will increase the unit cost of supplying an import to domestic consumers, shifting the world supply curve in the domestic economy leftwards, increasing the price of the good overall. It can be seen that when this is done, domestic production increases, but a welfare loss is incurred.

An advantage of tariffs is that they, like all other taxes, provide a source of income for the government, which in the context of free trade can be used to help make the country more competitive in the world economy.

Tariffs, however, depend on the *PED* and *PES* of domestically produced substitutes. If the demand or supply for domestically produced substitutes is inelastic, then the effectiveness of a tariff is reduced, and a larger tariff is needed to bring about a significant increase in domestic production.

7.3.2 Quotas

A quota is a quantitative restriction on imports. It can limit based on the value or the quantity of the good – either a maximum value or maximum quantity. When imposed, a quota will reduce the quantity supplied of imports in the domestic market, increasing the domestic price of the good. Domestic production increases, but a welfare loss is incurred.

An advantage of quotas is that foreign produces cannot overcome them by reducing prices.

However, they result in higher prices in the domestic market, resulting in greater profits for the foreign firms at the expense of domestic consumers, ceteris paribus. Also, the government does not get any revenue from imposing a quota as opposed to a tariff. The government can auction off import licenses which will afford them some revenue. Holders of these licenses can buy the good at the world price and resell them in the domestic market at higher prices, earning a profit.

7.3.3 Foreign exchange controls

A foreign exchange control is a limit on the amount a citizen can deal in foreign currrency. This will cause imports to fall to a level below the free market level, and consumers suffer.

This incurs large administrative costs in monitoring the amount citizens deal in foreign currency.

7.3.4 Subsidies

A subsidy is a payment from the government to firms when they produce a good. Subsidies can be used to help domestic firms compete with foreign producers by reducing their unit cost of production, shifting domestic supply to the right, increasing domestic production at the world price.

A subsidy will cause redistribution of income towards producers as their inefficiencies are covered up for through the taxpayers, who fund the subsidy. Producers who might have shutdown or left the industry are encouraged to remain in the industry as their products become competitive in the international market due to the subsidy, which prevents resources from being reallocated to other industries in which the country has a true comparative advantage.

A subsidy may lead to a domestic monopoly, as foreign competitors are excluded, which may lead to consumer exploitation through raising prices and reducing consumer surpluses. Costs may also rise unnecessarily as the monopoly becomes complacent. However, workers in that industry may benefit as production will be higher than without a subsidy and so they may enjoy higher wages.

An export subsidy can also be used as protectionism, where a country's government subsides goods that are produced for export, reducing the world price. Foreign consumers and domestic workers in subsidised industries benefit, but taxpayers who fund the subsidy lose out. Firms may also divert more resources to production of exports, which may lead to supply in the domestic market falling, leading to higher prices and lower welfare for domestic consumers.

7.3.5 Reasons for protectionism

Infant industry argument

A government may erect protectionistic measures in order to protect an infant industry while it is growing. An infant industry is a new industry that a government believes has potential comparative advantage but has yet to realise it. By applying protectionism, the domestic output increases and firms in the infant industry get to produce more, exploiting economies of scale that reduce their long run average cost, earning more profits that can be used for the research and development of new, better methods of production, and simply learning by doing. Eventually and in theory, the infant industry will catch up with more established foreign firms when it realises its comparative advantage, and it will be able to produce the good at a lower opportunity cost than another country. This has benefits for the country as well: as the industry grows, ceteris paribus there will be higher employment and lower prices for the goods the industry produces.

Protectionism has been used by countries like South Korea, Japan and Taiwan to develop their infant industries. However, there are still problems with the use of protectionism in tis way. It is difficult to correctly identify which industries actually have potential comparative advantage, and identifying the wrong industry can be costly for the country as taxpayer income and resources will be directed wrongly. In the short run, consumers will be faced with higher prices of goods produced by the industry. The infant industry may also grow to depend on the state for support.

Preventing dumping

Protectionism is also sometimes used to prevent dumping. Dumping is the practice of selling goods in an overseas market at a price below its marginal cost of production or below the price charged in the home market. After dumping, the quantity demanded of domestically produced goods falls and domestic producers see a fall in output, total revenue, and ceteris paribus, total profits. If their profit level drops below normal, they may have to exit the industry. A foreign firm can dump in order to cause domestic firms to exit the market, allowing them to become a monopoly. Governments have to protect their domestic firms from

such unfair competition using protectionism.

However, it is not easy to prove dumping, since it is difficult to find out a firm's marginal cost of production from outside the firm. Firms can file a complaint with the World Trade Organisation if they feel foreign firms are dumping their goods in their market, and a tax will be imposed that raises the foreign firm's price until the issue is investigated. However, firms sometimes use this just to buy time to restructure and become more efficient. Also, if a country can permanently import at a lower price from a foreign producer, then the foreign producer is more efficient than the domestic producer. The people in the country benefit from having the good at a lower price and so there is no reason for the country to protect its inefficient industries.

Protecting employment in a sunset industry

When a country loses comparative advantage in the production of a good, there will be a fall in demand for labour in the sunset industry, which leads to some workers losing their jobs. Suppose there is also a rising demand for labour in another industry, but workers from the sunset industry have the wrong skills to work in the expanding industry, which would have a wage inelastic labour supply due to the skill requirement. When demand rises, the quantity of labour employed will be less than if supply was wage elastic, and the difference in the quantity employed is equal to the number of workers unemployed in the sunset industry. Thus the number of workers looking for a job is equal to the number of jobs available but the jobs cannot be taken up due to skills mismatch, and so there is structural unemployment.

Protectionism can be used in this case to slow the decline of the sunset industry so that workers have time to acquire new skills to be employed in other industries, averting the problem of large structural unemployment.

Protecting employment in a recession

When there is a recession, or a depression in world trade, a country's export revenue will fall, leading to a fall in AD and real output. Firms produce lesser goods and so require fewer workers, so AD_L falls and unemployment rises. Households earn a lower level of income and so their purchasing power, material welfare and standard of living fall. The country may thus use protectionism to reduce imports and increase domestic consumption to boost AD to reverse this problem and boost employment.

This use of protectionism, however, is susceptible to the beggar-thy-neighbour effect.

Attracting foreign direct investment

A country can erect protectionistic barriers to make it more worthwhile for foreign investors to set up a branch in the domestic market than export directly because of high import tariffs or other measures. Thus protectionism can attract foreign direct investment to a country, boosting output and employment.

This risks retaliation from foreign countries, which will diminish the gains from increased foreign investment. There will also be a loss in consumer welfare due to protectionism allowing less efficient firms in the domestic market to survive.

Correcting a trade deficit

If a country is experiencing a trade deficit, it may use protectionism to limit its imports and import expenditure, increasing the trade balance.

However, it again has problems of retaliation, and the fact that there is a trade deficit may be a sign that there is a structural problem in the economy.

Preventing labour exploitation

Some countries use protectionism against developing countries with cheap labour on the grounds that the workers in those countries are being exploited, and they have an unfair advantage. However, economically, this does not make sense as if labour elsewhere is cheaper, then that place has a comparative advantage and resources in the home country should be directed to where it actually has a comparative advantage instead of trying to protect labour-intensive industries.

National security

A country may erect protectionistic measures to ensure that some important industries, such as the defense and weapons industries, can survive, so that for example, in times of war, when other countries may not be willing to export those goods, the country is still able to have weapons and defenses to protect itself.

7.3.6 Reasons against protectionism

In general, protectionism can be detrimental as it may invite retaliation by trading partners, such as erecting protectionistic measures of their own, leading to an overall reduction in world trade, or devaluing their currency, defeating some forms of protectionism.

Protectionism can also lead to firms or industries becoming overreliant on state support, becoming complacent and dynamically and productively inefficient, causing an overall worsening in societal welfare due to higher prices and lower output.

Finally, protectionism is subject to the world multiplier or beggar-thy-neighbour effect. Since one country's imports is another country's exports, when a country uses protectionistic measures against another country, they reduce the exporting country's export revenue and thus aggregate demand. If that country's national income falls as a result, their citizens will import less, and this may mean that the original country's export falls, and their AD falls as well, which will reduce some of the increase in domestic consumption brought about

by protectionism in the first place. If protectionism is being used to boost growth or employment, it may become less effective.

7.4 Globalisation

Globalisation refers to the rising volume of economic activities taking place across countries worldwide, including the exchange of goods, services, capital, labour and technology.

7.4.1 Forms of and factors causing globalisation

Increased trade in goods and services

There has been an increased volume of trade in goods and services over the years. Singapore's export volume has increased more than twofold in the past decade, for example, and its services are also increasingly demanded for by foreigners. Changing comparative advantages has also caused Singapore to start importing food and manufactured goods from other countries that have gained comparative advantage, like Malaysia and China. Singapore's import expenditure has also about doubled over the past decade.

This increase has been mainly due to trade liberalisation as countries seek to reap the gains from trade based on the theory of comparative advantage, in order to raise the material standard of living of their people.

There has also been a fall in transport costs due to containerisation, which is the global standardisation of shipping containers enabling goods to be transported in bulk over different modes of transport. Trade between distant countries is now economically viable and cheap.

Rapid development of countries, especially of the emerging economies, has led to increasing income and thus demand for normal goods in those countries, which have increased imports by those countries. The advancement of information and communication technology and the proliferation of the internet have also enabled information and ideas to be transmitted around the world extremely quickly, enlarging global demand by overcoming imperfect information and providing consumers information about goods produced by other countries and producers about suppliers and markets in other countries, leading to rising demand for imports of consumer goods and raw materials.

The World Trade Organisation has played a key role in this, both by encouraging countries to be more open and by helping to resolve trade disputes. Countries that join the WTO also agree to minimise the use of protectionism, increase transparency of trade policies, and provide developing countries special treatment to aid their development.

Countries that join regional or global organisations like ASEAN, the EU, the UN, World Bank and International Monetary Fund are also encouraged to be more open to trade and capital flows.

Increased trade in financial capital

There has also been an increase in the sizes of capital and financial accounts across countries worldwide through increased international capital flows across both developing and developed countries. Singapore has been actively attracting FDI in high-end manufacturing, knowledge-intensive industry and exportable services. It has also been increasing investment in other countries like ASEAN, China, and the Middle East. The volume of hot money flowing into Singapore for investment or as deposits in banks and other financial institutions have also increased, due to its status as an international financial centre.

This increase has mainly been due to a deregulation of the financial sector and a reduction of capital controls in many countries worldwide. With deregulation of banking and new financial activities, financial institutions are allowed to diversify activities and introduce new innovative financial products in pursuit of higher revenue and profits, like hedge, pension and real estate investment funds. Since greater financial activity usually leads to economic growth, governments have abolished capital controls i.e. the control of financial inflows and outflows from the capital and financial account, resulting in increases in capital trade between countries.

Improvements in technology have also contributed to this, as legal and technical consultation can be easily provided to clients in another country instantaneously through instant messaging or video conferencing. Financial capital can be traded across countries almost instantly with no cost, increasing the supply of financial products as it lowers the cost of supplying them, making financial businesses more profitable. Trade in capital between distant markets is thus more viable.

Increased movement of labour

The third form of globalisation is an increased movement of labour developing countries to developed countries, as there is high labour supply but low demand in the former, and low supply but high demand in the latter. This increases the supply of labour in DCs, helping to keep wages in DCs low.

Changes in government policies, for example the relaxation of barriers to labour mobility, and a greater knowledge of opportunities and accessibility, contribute to this increased movement of labour. For example, EU member countries agree to allow any EU citizen to work in any EU member state. Singapore has relaxed its immigration policies to allow a greater inflow of foreign labour to fill up shortages in various industries and keep wages competitive.

7.4.2 Benefits of globalisation

Boosts economic growth

The increase in trade in goods and services has led to an increase in net exports for many countries, increas-

ing *AD* and, assuming the economy is not at full employment, national income, which is actual economic growth. In Singapore, its physical constraints of small land size and a lack of natural resources have become less of a problem by virtue of globalisation, which has helped open up new markets for our exports, increasing foreign demand for Singapore's goods and services. In developing countries like India, remitted income by nationals working overseas enhance households' purchasing power, boosting *AD* and actual growth. Remittances might also be used to set up small enterprises that contribute to potential growth.

Foreign direct investment and international movement of labour allow the transfer of skills and technology from the developed countries to developing countries and simply between countries in general, boosting the long run *AS* of many countries.

Improves balance of payments

Globalisation helps to improve the trade balance by raising net exports of goods and services as well as net income inflows, thus improving the current account. It also improves net capital inflows due to the increased flow of capital across countries, improving the capital and financial account. The increase in capital flows also strengthens the exchange rate of open economies, reducing imported inflation.

Keeps wages competitive

The increased movement of labour across borders means workers will migrate from countries with high labour supply to those with low labour supply, boosting the supply of labour and keeping wages low, which helps to keep those countries competitive.

Increases firms' scope of profits

Globalisation has allowed firms to increase their levels of production and reap economies of scale as they export more, due to lower trade barriers, on top of domestic sales. It also allows firms to outsource operations to reduce cost of production. For example, Singapore Airlines outsources its IT processing and customer service to firms in India and the Philippines to take advantage of lower labour costs.

Improves efficiency

Developed countries typically have relative shortages of labour and financial capital reflected by higher wage and interest rates respectively. Globalisation allows these shortages to be fulfilled by the movement of labour from countries that are relatively abundant in labour and capital, reflected by lower wage and interest rates, which is in effect a reallocation of resources to produce goods that are more valued, thus making the allocation of resources more efficient. This can also be applied to labour in different industries, when one industry is expanding and requires more labour, and another is contracting and requires less.

Globalisation also increases the level of competition faced by firms as markets are easier to contest with international trade. Monopolies and oligopolies are thus forced to behave more competitively, reducing inefficiencies like X-inefficiency, giving consumers higher welfare.

Increases variety

The increased sharing of ideas and trade brings new goods to each country, increasing the variety enjoyed by consumers, thus improving consumer welfare as they have more choices.

Improves workers' skills

Workers who work for MNCs that set up foreign branches will be exposed to the good practices of those MNCs, improving their skills.

7.4.3 Challenges of globalisation

Increased volatility in economic growth

Globalisation increases the vulnerability of countries to external shocks. When a major economy like the US or China experiences a depression, demand for many other economies' exports falls, thus causing those economies' *AD* and thus national income to fall, leading to negative actual growth, causing a recession. This also impacts business confidence, also reducing foreign direct investment and thus capital accumulation, affecting potential growth in the long run.

Increased volatility of price level

Globalisation has also made open economies, especially those that have little resources of their own, have more volatile general price levels. When there is high inflation in other countries, the price of their exports increases and countries that depend on those exports will see an increase in prices, which is imported inflation. The horizontal segment of *AS* shifts upwards, increasing general price level.

Structural unemployment and income inequality

When a country loses comparative advantage in an industry, demand for goods of that industry from that country will fall – both domestic and external. Output by firms in that industry falls, and thus those firms require less labour, retrenching some workers. If these workers do not have the right skills to work in another industry, they will become structurally unemployed. The country refocuses its economy towards goods in which the country has a comparative advantage, causing workers and firms in industries that the country does not have a comparative advantage in to lose out.

Many developed countries like Singapore have lost their comparative advantage in manufactured goods due to cheap labour from countries like India and China. Because of this, the demand for less-skilled labour falls, and their wages may fall (although in reality wages may be sticky downwards), increasing income inequality. This is reinforced by workers from

India and China emigrating to developed countries, which increases the supply of less-skilled labour, further decreasing their wages and exacerbating income inequality.

Volatile balance of payments and exchange rates

Globalisation results in an increased volatility of the balance of payments. In 1997, when financial institutions in Thailand failed due to failed investments in the property market, hot money withdrew from the entire East Asia, leading to large capital outflows that caused severe balance of payments deficits and depreciation of their currencies.

Income earned by foreign workers as well as the profits and earnings of foreign-owned firms also worsen the current account balance when they are remitted back to their home countries, which affects small, open economies like Singapore.

Exhaustion of resources

Globalisation imposes environmental costs by causing a rapid exhaustion of resources, like essential minerals, especially when countries owning these resources now not only produce for themselves but also for countries that buy their exports. This will adversely impact productive capacity in the long run.

Developing countries also do not have very many laws against pollution, causing large external costs in the production of some goods, in terms of carbon emissions and the contribution to global warming. This is worsened because developed countries do have laws against pollution, and so MNCs set up factories in places that do not have such laws to take advantage of that fact.

LDCs lose out

LDCs generally do not gain as much from globalisation compared to DCs as globalisation is generally used to take advantage of LDCs being LDCs, with FDI used to set up low-skilled jobs that contribute little progress to the country. Many MNCs are also accused of underpaying workers. Globalisation thus allows MNCs to earn more profits at the expense of LDCs.

Some MNCs have grown so large that governments depend on them to create jobs or for financial support. This allows MNCs to lobby LDCs' governments to craft policies to their advantage, such as tax cuts or relaxation of labour market or environmental regulations. MNCs also sometimes consume resources from LDCs to support their parent countries, and high-polluting firms from DCs may relocate to LDCs so that DCs can benefit without suffering from pollution.

Globalisation has also worsened income inequality between DCs and LDCs, because DCs have had their growth boosted far more than LDCs have, for the reasons above. Another reason is that LDCs generally get poor terms of trade due to their reliance on primary industries that see declining product prices.

8 Macroeconomic Problems

8.1 Negative economic growth

Economic growth is one of the indicators used to assess an economy's health. Economic growth is generally split into actual and potential growth.

Actual growth or, informally, simply growth, measures the change in the volume of output produced within the country over a year. It is generally measured by real GDP. On the PPC, actual growth is illustrated as a movement from a point in the curve to a point closer to, or on, the curve. On an *AD-AS* diagram, it is seen as an increase in national income.

Potential growth measures the change in the economy's ability to produce. It is the maximum speed at which the economy could grow. On the PPC, it is seen as an outward shift of the curve. On an *AD-AS* diagram, it is seen as a rightward shift in the vertical segment of *AS*.

8.1.1 Causes of negative growth

Fall in *AD*

A fall in aggregate demand will, assuming the economy is not at full employment, cause a fall in national income, which is negative actual growth.

A fall in *AD* can be caused by an increase in interest rates. When interest rate increases, domestic consumption falls as it becomes more expensive to borrow to buy expensive items like cars or houses. Interest is also the returns to savings and so the opportunity cost of spending increases, thus consumption falls. Investment also falls, as the cost of borrrowing increases, so some projects which were profitable are no longer so.

An increase in personal income taxes results in a fall in consumers' disposable incomes and purchasing power, so they spend less and consumption falls. An increase in corporate income taxes decreases the expected yields from investment, thus reducing investment. Both of these are components of *AD* and so *AD* falls.

Government expenditure is itself a component of *AD*. If it falls, then *AD* falls.

If a country's exchange rate increases, the price of its exports in foreign currency increases. Assuming $PED_x > 0$, this causes the quantity demanded of the country's exports to fall, and so export revenue falls. *AD* falls.

Fall in *AS*

A fall in aggregate supply will cause negative potential growth, and if the economy is near or at full employment, negative actual growth.

If natural resources used to produce goods in a country are depleted, the country can produce less of those goods, so aggregate supply falls. Natural disasters

can sometimes destroy land, causing less land to be available for production purposes.

If there is a fall in the quantity of labour, perhaps due to a natural disaster or disease, a labour shortage may result. Without enough labour, the economy cannot produce as much, and so *AS* falls.

If there is a fall in investment, or otherwise for some reason, the amount of capital created is not enough to replace that which has worn out, the country's stock of machinery and productive capacity will be reduced. *AS* falls.

8.1.2 Consequences of negative growth

Lower living standards

If national income falls, then the income of each citizen falls, and their purchasing power falls. They are less able to purchase goods and services for consumption, so their material standard of living falls, and standard of living falls.

Increase in unemployment

If national income falls, it means firms are producing less goods. They thus require less labour and so the aggregate demand for labour falls. Assuming wages are sticky downwards, there will be a surplus of labour, and demand-deficient unemployment results.

Reduction in government revenue

Since the income of each citizen falls, each citizen pays less tax to the government, and so government tax revenue falls. Since consumption also falls, revenue from indirect taxes also falls.

Decrease in ability to redistribute income

It may become more difficult for the government to distribute income to the poor without the rich losing out, as the taxes collected falls, so there is less revenue to redistribute in terms of subsidies and funding for social services.

Fall in confidence

Negative growth usually causes a fall in business confidence. They expect lower yields from investments and so investment falls at all interest rates.

8.2 High inflation

Inflation is defined as a period of sustained and inordinate increase in general price level. Inflation is usually measured by the consumer price index, an index measuring the price of a fixed weighted basket of goods and services consumed by a typical household. The consumer price index is usually specified relative to a base year.

The rate of inflation is the percentage change in the consumer price index. It is usually compared year-on-year.

8.2.1 Demand-pull inflation

Demand-pull inflation is a situation where *AD* is persistently greater than *AS* i.e. the economy is always close to or at full employment. If *AD* continues to increase, the general price level increases persistently, which is inflation.

In Singapore, demand-pull inflation is likely to be externally generated, simply due to our large external demand – export revenue makes up about 75% of our *AD*.

8.2.2 Cost-push inflation

Cost-push inflation is a situation where persistent increases in the unit cost of production causes a sustained and inordinate increase in general price level. Cost-push inflation is independent of *AD*.

Wage-push inflation

Wage-push inflation occurs when strong trade unions bargain for increases in wages that exceed increases in labour productivity, which results in an increase in unit cost of production across many markets, shifting individual markets' supply curves to the left. This causes the horizontal segment of *AS* to shift upwards. General price level rises.

When prices rise, trade unions may bargain for even higher wages to keep up with the increases in price level, and the process repeats. This is known as a wage-price spiral, and wage-push inflation results.

Imported inflation

When there is a rise in the price of imported raw materials, the unit cost of production of goods produced using those materials increases. The supply for those goods falls and if the economy is one that produces many such goods, then *AS* falls significantly, and price levels rise. If the prices of imported raw materials continues to increase, then the process repeats and price levels continue to rise, which is inflation.

The increase in the price of imported raw materials may be caused by a devaluation of a country's currency.

Profit-push inflation

Cost-push inflation may be caused because monopolies or firms with large market power try to increase their profits by raising the prices of their products.

Increase in indirect tax

A rise in indirect taxes, especially those that apply to all goods, like goods and services tax, may increase firms' costs of production, decreasing *AS*.

Structural rigidities

Structural rigidities may lead to inflation. When wages rise in a market due to supply of labour in the market being wage inelastic, unit labour costs rise, so unit costs of production rise and if this makes up a significant part of production in the country, *AS* falls.

8.2.3 Benefits of low inflation

If a country has relatively lower inflation compared to competing countries, its export competitiveness is

boosted, and demand for the country's exports may increase, increasing export revenue and improving the trade balance and thus the current account and balance of payments; it also boosts economic growth. Of course, this may then lead to inflation.

Low but non-zero demand-pull inflation encourages firms to expand their output as non-zero demand-pull inflation implies rising demand, which leads to higher prices and profits. Firms may undertake investments to expand output, which increases capital accumulation, thus increasing AS (and also AD directly), leading to potential growth.

Price stability enables businesses to create long-term plans with confidence, increasing investment in the country, which again increases AD and AS in the long run.

8.2.4 Costs of inflation

Shoe-leather and menu cost

Shoe-leather cost refers to the costs incurred in moving money in and out of financial institutions in search of the highest returns.

Menu cost refers to the cost of constantly having to revise price lists, labels and menus.

Income redistribution

People who earn incomes that are fixed based on their nominal value lose out the most when inflation occurs, as their real income falls, and they are less able to purchase goods and services. However, variable income earners may not lose out, depending on how their income is determined: insurance agents or property agents, for example, may earn higher commissions when there is inflation.

Debtors also gain while creditors lose as the real value of debt falls when price increases, so the purchasing power of the money repaid by a debtor will be less than that of the money borrowed.

Governments gain while taxpayers lose out as when nominal income increases to match inflation, taxpayers may advance into the next tax bracket and pay more tax, even if there is no change in real pre-tax income.

Businessmen gain from demand-pull inflation as prices usually rise faster than production costs, so profits rise. However, when there is cost-push inflation, profits may fall as rising cost is the reason for inflation.

Savings

When there is inflation, savers lose as the real value of savings falls, so purchasing power of savings falls. Even with inflation, if the interest rate is less than the inflation rate, the real value of savings will still fall. People may be discouraged from saving, increasing consumption, ceteris paribus.

Those who are risk-averse, however, may choose to increase savings in order to maintain the real level of savings, and to prepare for uncertainty, so savings may increase and consumption may fall. When this happens, negative growth may result.

Resource allocation

In a market economy, prices provide signals to producers in production decisions. When a producer sees that the price of his product has increased faster than other products, he will infer that demand for his product has increased and so devote more resources to the production of that product.

When there is inflation, it becomes hard to distinguish whether a rise in price is due to increased demand or simply due to inflation. Misallocation of resources may occur.

Compromising money

When there is hyperinflation, people may no longer accept money as payment for goods as the value of the money falls rapidly. It also becomes impractical to express the value of goods and services as the numeric prices must be constantly adjusted to reflect the falling value of money.

Money also becomes a poor store of value as the same amount of money can buy less goods and services than before, so people find it unwise to use money to store value since its value is decreasing. Finally, businessmen also become reluctant to credit as the amount they get back will be worth less.

Export competitiveness

When a country has higher inflation rates than competitors, its goods and services will become less price competitive, ceteris paribus. The price of exports in foreign currency increases and assuming $PED_x > 0$, quantity demanded falls and so export revenue falls.

If quantity demanded of exports falls, then demand for the country's currency falls, so the country's exchange rate falls. This is reinforced by imported goods becoming cheaper than domestic goods, so demand for imports increases, and import expenditure increases, so supply of the currency increases.

These effects also lead to a fall in the trade balance, the current account balance, and thus the balance of payments.

Investment competitiveness

Inflation also makes a country less attractive for investment, as inflation means the cost of production increases. The depreciation of the country's currency may also lead to capital flight, further worsening the exchange rate.

8.3 High unemployment

Unemployment refers to existence of people who are of working age, are available to work and are actively looking for a job, but cannot find one.

8.3.1 Demand-deficient unemployment

Demand-deficient unemployment occurs when the number of workers who are willing and able to work at the prevailing wage i.e. the quantity supplied of labour is greater than the number of job vacancies available i.e. quantity demanded. There is a surplus in the labour market.

It is usually caused by a recession. When national income falls, firms produce less and so require less labour, so the aggregate demand for labour falls. Since wages are sticky downwards due to things like contractual obligations, wage does not fall and there will be a surplus of labour.

8.3.2 Equilibrium unemployment

Equilibrium unemployment occurs when workers are unable or unwilling to take up jobs available at the prevailing wage. When an economy achieves full employment, it does not mean there is no unemployment; equilibrium unemployment still exists – but demand-deficient unemployment does not. The rate of unemployment at full employment is known as the non-accelerating inflation rate of unemployment, or NAIRU.

There are various causes of equilibrium unemployment.

Search unemployment

Search unemployment or frictional unemployment exists due to poor information in the labour market causing a time lag before people can find suitable jobs. Employers are not fully informed about the labour that is available and workers are not fully informed about the jobs that are available. Generally, search unemployment is inevitable, short-term and does not pose a serious problem.

Structural unemployment

Structural unemployment occurs when there is labour immobility and a change in demand patterns. If there is a fall in demand for an industry's good, either because the industry is declining or due to a loss of comparative advantage, demand and thus quantity demanded (i.e. the number of jobs) for labour in that industry also falls. Some workers will be retrenched and if they are unable to find a new job in another industry, they are structurally unemployed – specifically, sectoral unemployment.

If workers are unable to take up jobs because they are unwilling or unable to physically relocate to take up those jobs, as opposed to not having the right skills to do so, they are regionally unemployed.

If workers are retrenched because they do not have the skills to handle new technology or otherwise because their job has been replaced by technology, they are technologically unemployed.

Seasonal unemployment

Seasonal unemployment is equilibrium unemployment due to some industries being subject to seasonal demand, like tourism. During the peak seasons, there is high demand for labour, and vice versa, so there is high seasonal unemployment in the off-peak season.

8.3.3 Costs and benefits of unemployment

Unemployment implies that output and standard of living is lower than it could be, because it means there is unused labour. Higher unemployment also increases government expenditure on unemployment-related benefits while simultaneously reducing tax revenue from both direct and indirect taxes. Crime levels may increase as the unemployed steal to obtain necessities.

For firms, unemployment means that the demand for goods is lower than it could be, since some people are without an income – if they had income, they would consume more normal goods.

The unemployed experience a fall in income as unemployment benefits are usually lower than incomes they would get if they were working (otherwise there would be no incentive to work). The loss of status and the stressed involved in being unemployed may also have adverse effects on workers.

Unemployment has some questionable benefits too. In theory, having a small level of unemployment can ease demand-pull inflation. It may also make it easier for firms to find employees since there are many unemployed to choose from. Finally, workers get more time to enjoy leisure activities.

8.4 Balance of payments deficit

The balance of payments is a record of inflows and outflows of money in and out of a country due to transactions between the residents of the country and the residents of the rest of a year, typically in a year. The value of the balance of payments is the total value of receipts minus the total value of payments for international transactions.

The balance of accounts is usually split into the current account and the capital and financial account.

The capital account has to deal with trade, income flows and current transfers; it is composed of the visible balance i.e. the balance of trade, which comprises exports and imports of goods, and the invisible balance which comprises trade in services, factor income flows i.e. wages, interest, rent and profits and current transfers e.g. government aids or private gifts of money.

The capital and financial account reflects the net change in foreign financial assets and liabilities. The capital account records the transfers of capital associated with the purchase and sale of fixed assets, patents and trademarks, to and from abroad. The financial account records the flows of money into and out of the country for investment or deposits into banks and other

financial institutions.

The balance of payments also consists of errors and omissions, to account for errors, and the official reserves transactions, where surpluses are deposited and deficits are withdrawn.

8.4.1 Current account deficit causes

A current account deficit can be caused by cyclical or structural factors. Cyclical factors have to do with the business cycle, are short-term and are usually not a big worry for the country. Structural factors, however, are more serious and must be addressed by the government.

Cyclical factors

When a country has relatively high inflation, its exports become more expensive in foreign currency and thus less competitive. The quantity demanded of the country's exports falls, assuming $PED_x > 0$. Export revenue thus falls. At the same time, imports become cheaper in domestic currency compared to domestic goods. Demand for imports increases, so import expenditure increases. The balance of trade falls, and thus the current account falls.

When a country has relatively high economic growth, its national income is increasing at a faster rate than other countries'. Assuming imports are normal goods, demand for imports, quantity demanded of imports, and thus import expenditure rises. Conversely, since other countries have lower economic growth, their national incomes are rising at a slower rate and so their demand for the country's import rises at a lower rate. Thus the country's export revenue does not rise as much as import expenditure, and so the balance of trade and thus the current account falls.

Structural factors

If a country has an overvalued currency, its exports are likely to be expensive in foreign currency while imports are cheap in its currency, so its export revenue is likely to be low while its import expenditure is high. Any further appreciation of the currency will cause prices of its exports in foreign currency to increase while prices of imports in its currency decreases. As long as $PED_x > 0$, export revenue falls, and as long as $PED_m > 1$, import expenditure rises. Thus the balance of trade worsens.

If a country experiences a loss in comparative advantage, it means other countries' exports are now cheaper than the country's exports. Demand for the country's goods, both external and domestic, falls as consumers switch to goods from more efficient countries. Thus export revenue falls while import expenditure increases, and so the balance of trade worsens.

If a country is pursuing an ambitious development programme, it may import large amounts of resources and capital to aid in its development, causing import expenditure to be high. The balance of trade may worsen.

8.4.2 Capital and financial account deficit causes

If a country has relatively lower interest rates, short-term capital i.e. hot money flows out of the country to earn more returns from higher interest rates in other countries, causing the financial account of a country to worsen.

If there is low business confidence in a country, local investors will prefer to invest overseas, while overseas investors do not invest in the country. The capital and financial account of the country will fall as investors invest overseas.

8.4.3 Costs of a balance of payment deficit

A persistent balance of payments deficit means that the country's residents are importing more than the country is exporting. There will be a greater supply of the country's currency in the market, and so the currency depreciates. If the government is pursuing a controlled exchange rate, it will have to intervene and buy domestic currency and sell foreign exchange reserves to prevent the exchange rate from falling too much, However, this cannot go on indefinitely as the country has a finite amount of foreign reserves. The currency will eventually be allowed to depreciate.

A depreciating currency will lead to a worsened terms of trade as there is a decrease in the foreign price of exports and an increase in the domestic price of imports, so more goods are exported to support a given volume of imports.

Sometimes, balance of payment deficits are financed by foreign borrowing. Since the money borrowed has to be repaid in the future with interest, this lowers the standard of living of future generations.

There will also be a fall in the stock of the country's assets if the balance of payment deficit is financed through the sale of assets. The sale of assets also means future investment income is not received by the country, which reduces the standard of living of future generations.

9 Macroeconomic Policies

In general, macroeconomic policies can be divided into demand management policies, and supply-side policies.

Demand management policies in general consist of monetary policies and fiscal policies. Monetary policies involve the manipulation of monetary variables like exchange rate, interest rate and the supply of money to influence AD. Fiscal policies involve the use of government spending and taxation to influence AD.

9.1 Exchange rate policy

Decreasing exchange rate increases net exports, as devaluing the currency reduces the cost of the country's exports in foreign currency while increasing the

cost of imports in the country's currency, so assuming $PED_x > 0$ and $PED_m > 1$, the quantity demanded of the country's exports in foreign currency rises so export revenue rises, and the quantity demanded of imports in the country falls more than proportionately so import expenditure falls, which reinforce an increase in net export revenue, increasing AD. The reverse argument applies.

The condition that $PED_x > 0$ and $PED_m > 1$ can be extended and mathematically proven to simply having the sum of the two be greater than one. This is the Marshall-Lerner condition, which states that for a devaluation of a country's currency to increase net exports, $PED_x + PED_m > 1$.

9.1.1 Merits of exchange rate policy

For countries with relatively large external demand, like Singapore, exchange rate policy has the greatest effect on AD, since net exports will make up the greatest proportion of AD. Net exports takes up about 75% of Singapore's AD, for example.

9.1.2 Problems of exchange rate policy

Imported inflation

For countries that import a large proportion of the raw materials used in production of goods, a devaluation of the currency may lead to imported inflation, with prices of goods in domestic currency increasing, because the price of imported raw materials in domestic currency increases, leading to an increased unit cost of production and thus a fall in supply of goods which involve imported raw materials. The price of exports in foreign currency thus may not fall as much, reducing the increase in net exports.

If the increase in net exports leads to demand-pull inflation, causing price levels to rise, then the price of export goods in domestic currency may increase, offsetting the fall in price of exports in foreign currency due to the devaluation, similarly reducing the increase in net exports.

J-curve effect

A devaluation, in the short run, causes net exports and trade balance to fall due to the J-curve effect. The main reason for this is time lags, as producers and consumers take a while to adjust their purchases to the changed prices caused by the change in exchange rate. There may also be contractual agreements or planned advance orders, preventing the quantity of exports or imports from changing until the contracts lapse. This causes export revenue to remain constant, assuming quantity of exports is constant, while import expenditure rises as a constant quantity of imports is combined with increasing prices of imports in domestic currency, so net exports falls. This is in line with the Marshall-Lerner condition, as quantities not changing implies the demands are both price inelastic.

9.2 Interest rate policy

Lowering interest rate increases consumption and investment as interest rate is the cost of borrowing, which when lowered will make consumers more willing and able to borrow to buy expensive items like cars, increasing consumption, and firms invest more as investments with lower expected returns will appear more profitable since the cost of borrowing to undertake those investments have fallen, increasing investment. Thus AD increases. The reverse argument applies.

A reduced interest rate will also cause an outflow of hot money as investors seek higher returns from countries with higher interest rates, so the supply of the country's currency increases while the demand falls and so the currency depreciates. Prices of the country's exports in foreign currency falls while prices of imports in the country's currency rises, and assuming the Marshall-Lerner condition holds, net exports increases, also increasing AD. This is a small point, however.

9.2.1 Merits of interest rate policy

Since investment increases, capital accumulation increases and this will benefit potential growth in the long run as AS will increase in future with increased capital accumulation.

9.2.2 Problems with interest rate policy

If the economy is in recession, consumer and business confidence may be low, and increasing interest rate may not increase consumption or investment by much as consumers want to save more in case they e.g. become unemployed, and firms are pessimistic about investments. This reduces the effectiveness of interest rate policy.

Some firms may not need to borrow in order to invest as they may have their own reserves. Changing interest rate will not really affect how much such firms invest, which diminishes the effectiveness of interest rate policy.

Singapore does not use interest rate policy due to its choice of controlling its exchange rate and having free capital flow. If Singapore were to lower interest rates, for example, hot money would flow out of Singapore, foiling the policy.

9.3 Fiscal policy

Fiscal policies involve the use of government spending and taxation to influence AD.

Reducing personal and corporate income taxes will increase the disposable income of households and the post-tax profits of firms, increasing their purchasing power and expected yields from investments respectively. For households, they increase consumption of normal goods and so consumption increases. For firms, the marginal efficiency of investment curve shifts right and at every interest rate, investment increases. Thus AD increases.

Increasing government spending directly increases *AD*, it being a component of *AD*.

9.3.1 Merits of fiscal policy

A fall in personal income taxes will increase the opportunity cost of leisure, which disincentivises leisure and encourages work. People who are currently not seeking jobs may decide to do so, which will boost *AS* in future.

Since investment increases, capital accumulation increases and this will benefit potential growth in the long run as *AS* will increase in future with increased capital accumulation.

9.3.2 Problems with fiscal policy

Increasing government spending may lead to the crowding-out effect if government spending is financed by borrowing, as the government will be competing with private firms for loans, which increases the demand for loans and thus the interest rate, reducing investment and diminishing the increase in *AD* from increased government spending.

The government may also risk running into a budget deficit if it increases government spending. To finance these debts, the government may have to borrow, and then taxes may rise in future in order to repay loans, which will counter an increase in *AD* in the present. Too huge a government debt may weaken investor confidence which reduces foreign investment in the country, leading to capital flight, which will destabilise the exchange rate, and a reduced credit rating, which will make it more expensive for the country to borrow.

Fiscal policy may also involve time lags, depending on whether legislation is required to change in government spending or taxes, and how fast the changes cause an effect on consumption and investment.

If the economy is in recession, consumer and business confidence may be low, and direct taxes may not increase consumption or investment by much as consumers want to save more in case they e.g. become unemployed, and firms are pessimistic about investments. This reduces the effectiveness of this form of fiscal policy.

In Singapore, fiscal policy has limited effect due to its small fiscal multiplier, which in turn is due to having a high marginal propensity to import and marginal propensity to save. The effect of tax cuts is also likely to be small, given that domestic demand is a relatively small component of *AD*, and that our tax base is small – only one-third of the working population. Singapore's tax system is also not very counter-cyclical as taxes are based on the previous year's income: if the current year is a recession year while the previous is a boom year, individuals and firms pay tax in the current year based on higher incomes earned the previous year, when ideally the system should leave them with more money due to the recession.

9.4 Other policies

To solve a current account deficit, a government may use export subsidies and tax rebates for export industries to boost the country's exports by making their unit cost of production lower, in turn reducing export prices and thus increasing export revenue, assuming $PED_x > 1$, boosting the current account and thus the balance of payments.

The government can also use protectionism to do so – the above policy is actually a form of protectionism anyway.

Of course, this comes with all the demerits of protectionism.

9.5 Supply-side policy

Supply-side policies are a basket of policies used to influence *AS*. They are generally categorised into market-oriented policies and interventionist policies. Market-oriented policies rely on market forces and competition to achieve greater efficiency, while interventionist policies rely on market intervention and the correction of supposed market failures.

9.5.1 Market-oriented policies

Cutting direct tax rates, while primarily a fiscal policy, affects *AS* as well. As explained earlier, cutting corporate income taxes results in an increase in investments, increasing capital accumulation, innovation and the development of new technology, leading to an increase in productive capacity and thus *AS*. Lower personal income taxes increases the opportunity cost of leisure, increasing the incentive to work for longer or more efficiently and also enticing those previously not in the labour market to work. Supply in individual markets increases and so *AS* increases.

Problems However, reducing personal income taxes may also encourage people to work fewer hours since they can get the same amount of disposable income while working less. Reducing corporate income taxes may result in firms paying higher dividends to shareholders instead of investing.

Cutting unemployment benefits will also increase the opportunity cost of leisure, which incentivises work, eventually leading to an increase in *AS*.

Problems However, this may increase income inequality especially for those who are structurally unemployed, and if there is low unemployment, this will not help much at all.

The government can also encourage competition by introducing pro-competition policies like antitrust laws, removing barriers to entry to regulated markets, privatisation, and reducing trade barriers. The increase in competition encourages firms to become more efficient, producing a greater output from a given amount of resources. Unit cost of production falls, so supply curves shift right, and *AS* increases.

Problems In practice, implementing such laws alienates the business community, and it also reduces supernormal profits, making it more difficult for firms to innovate and do research and development as they have less resources to do so.

The government can reform trade unions through laws that restrict the extent to which unions can push wages above equilibrium and enforce restrictive practives, increasing employment, labour market flexibility, and efficiency. The reduced labour costs in turn increase firms' profits, enabling more investment, helping *AS* increase in future.

Problems In practice, implementing such laws will alienate workers. Flexible labour markets will also increase income inequality as workers are forced to accept jobs at lower wages. It also leads to lower job security as trade unions have less power with regards to retrenchment and the like, which may cause greater stress in the workplace and thus lower efficiency, diminishing the increase in *AS*.

9.5.2 Interventionist policies

The government can provide subsides for education and training, which will reduce the price of doing so. Employers and workers will be more willing and able to send employees to and attend, respectively, training. If the training helps to improve workers' productivity, each worker can produce more output per man hour, resulting in a lower unit cost of production, increasing supply and thus *AS*.

Merits This also increases *AD* through an increase in government spending.

Problems However, it requires time to take effect, and it may not be very effective at all, depending on how receptive workers are. It also requires government spending, and so has all the associated issues.

Subsidising research and development will make firms more willing and able to conduct it as the price of doing so decreases. If the research results in new methods of production that are more efficient, the unit cost of production falls; firms may also be able to produce more from the same amount of resources, so supply and *AS* increases.

Merits This also increases *AD* through an increase in government spending.

Problems Research and development may not result in any better method of production – it is uncertain. If this happens, funds used for the research and development by firms would have been wasted since an opportunity cost has been incurred and they could have been used for other purposes like upgrading equipment or giving employees bonuses, but instead they were channeled into research and development which ultimately did not result in an increase in profits or other benefit for the firm.

To combat search unemployment, the government can provide information through mass media, job agencies and job fairs, to help unemployed workers be matched to suitable jobs more quickly.

Problems The success of such a policy depends really on how keen the unemployed are about getting unemployed. If they do not really want a job, they may not seek for jobs as actively, and so stay unemployed for longer.

9.5.3 Merits of supply-side policy

Supply-side policy can act on both *AD* and *AS*, bringing about non-inflationary growth; the increase in *AD* helps to drive the increase in national income, while the increase in *AS* prevents inflation, allowing the actual growth to be sustained.

If prices are lowered due to supply-side policy, it may also improve the price competitiveness of exports, which will improve the country's current account and thus balance of payments.

9.5.4 Problems with supply-side policy

Supply-side policies often involve high costs, which will incur a high opportunity cost, as resources that could be channeled elsewhere are now channeled to these policies, and if the benefits of the policy are less than the benefits that the resources could have brought if used elsewhere, then there is a misallocation of resources.

If the costs of supply-side policy are funded through taxes, the government may increase taxes, which may have disincentive effects on work as the opportunity cost of leisure is decreased. Workers now have less incentive to work, which may cause labour productivity to fall, offsetting the benefits from supply-side policy.

If the costs are otherwise funded through government borrowing, and taxes may rise in future in order to repay loans, which will lead to disincentive effects as above. Too huge a government debt may weaken investor confidence which reduces foreign investment in the country, leading to capital flight, which will destabilise the exchange rate, and a reduced credit rating, which will make it more expensive for the country to borrow.

Supply-side policies are also uncertain, as mentioned earlier.

On their own, supply-side policies will not cause actual growth if the economy is not near or at full employment. An increase in *AD* is needed for the economy to have actual growth.

9.6 Macroeconomic conflict

Macroeconomic goals can sometimes conflict with each other. Most often, inflation conflicts with everything else as combatting inflation usually involves cooling the economy and reducing pressures while the other goals involve boosting the economy.