CHAPTER 3

Microeconomic Objectives and Policies

OVERVIEW OF CHAPTER

As all economic agents face the central economic problem of scarcity, they have to make decisions which aim to maximise their welfare (i.e. consumers seek to maximise utility while producers seek to maximise profit). From the previous chapters, we have seen how consumers and producers (the economic agents in the markets) are involved in the decision-making process. In the free market, scarce resources are allocated via the price mechanism. However, when left on their own, markets can produce undesirable outcomes in terms of efficiency and equity. Government intervention is thus required to achieve the government's microeconomic objectives of efficiency and equity.

KEY DECISIONS RELATED TO THIS CHAPTER

- Consumers decide what and how much of the goods and services to consume to maximise their satisfaction given their limited purchasing power and information.
- Producers decide what and how much goods and services to produce to maximise their profit given their limited resources and information.
- Governments decide whether to intervene in the market, which sector, and how to intervene in order to achieve efficiency and equity given limited public funds and balancing differing objectives.

KEY ECONOMIC AGENTS

- Consumers
- Producers
- Governments

1. INTRODUCTION

Learning Objectives:

- ✳ Describe the key features of an ideal free market system
- ✳ Identify the roles of the government

Throughout your journey in the study of Economics thus far, you have learnt how free market forces of demand and supply (the price mechanism) work to allocate scarce resources between competing uses. However, governments can often be seen attempting to influence the production and consumption of various markets at the microeconomic level in the real world.

Why does the government not leave the price mechanism alone to allocate scarce resources? Has the free market failed in the efficient allocation of scarce resources? In what circumstances do they fail to do so?

Chapter 3 considers the above questions and discusses how governments intervene in markets to achieve the microeconomic objectives of efficiency and equity and how these interventions could create inefficiencies.

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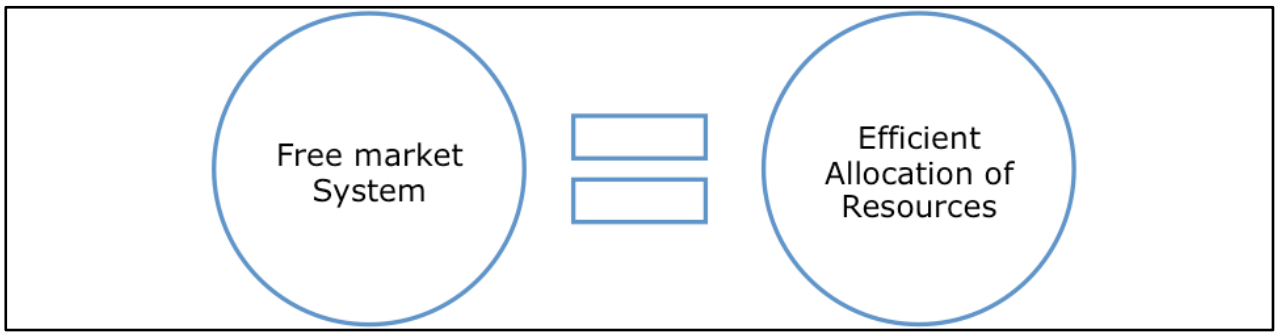

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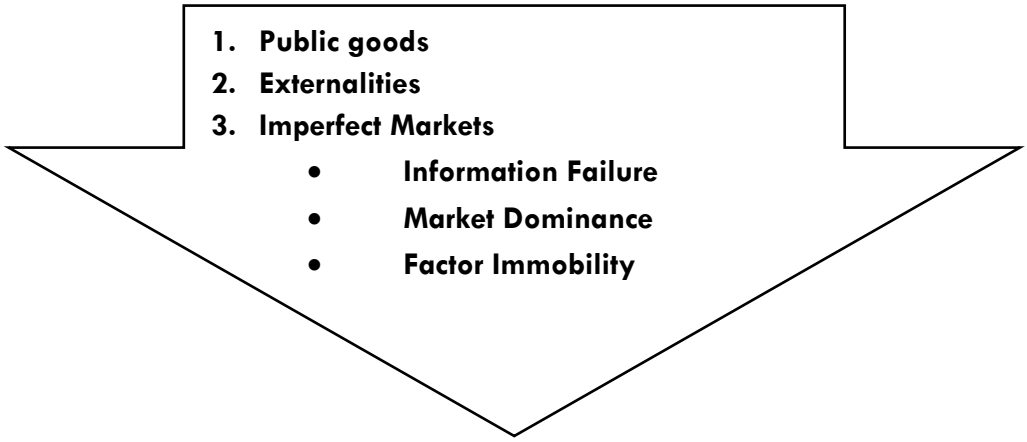
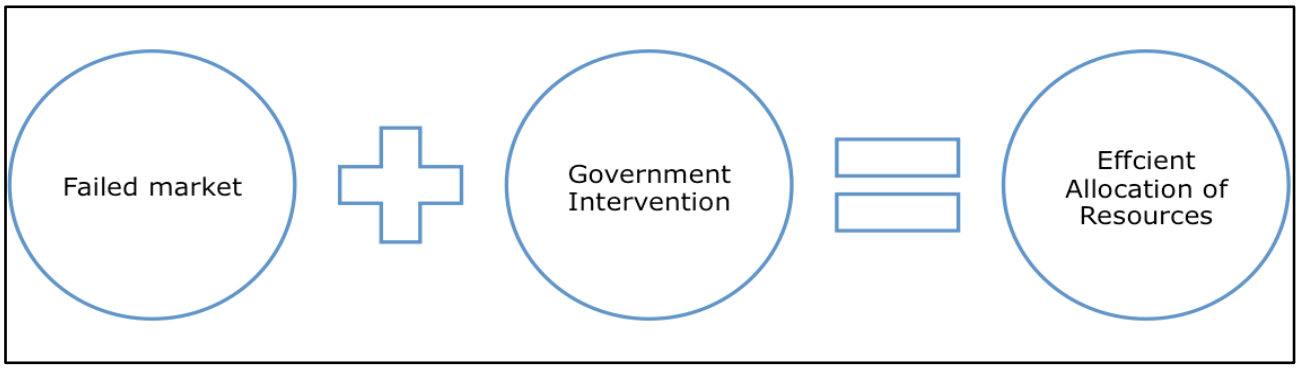




1.1 FEATURES OF THE MARKET SYSTEM

Recall that resource allocation in a free market system is based on the price mechanism to signal and direct resources to the production of goods in accordance to consumer preferences. Under a perfect market, which is an ideal free market system with the absence of various sources of

market failure, the price mechanism would automatically lead to the efficient allocation of scarce resources to achieve maximum welfare for society. However, the price mechanism as an efficient allocative mechanism of scarce resources exists is an ideal rather than a reality.

Recall in Chapter 2 that the features or assumptions of the free-market system are:

a. Private Ownership of Property

Individuals have the right to own, control and dispose of land, capital and natural resources. Owners of factors of production, thus, have the right to the income (in the form of rent, interest and profits) earned from the use of these factors of production.

b. **Freedom of Choice and Enterprise**

Economic agents undertake all decisions. Household (consumers) are free to decide what to buy with their incomes (commonly known as consumer sovereignty). Workers are free to choose where and how much to work. Firms (producers) are free to choose what to sell and what production methods to use.

c. **Pursuit of Self-Interest**

Economic activity in the free market system is driven by self-interest. Each unit in the economy attempts to do what is best for itself. Hence, firms aim to maximise profits, consumers aim to maximise satisfaction and workers aim to get jobs that yield as high a return as possible. (Adam Smith, father of modern Economics, believed that the individual pursuit of self-interest leads to the maximum good for society)

d. **Perfect Competition**

Competition is an essential feature of the free-market economy. Competition here refers primarily to perfect competition where, in the market for each commodity, there are a large number of buyers and sellers, each having an insignificant share of the market and hence there is no influence on the market demand and supply. No single buyer or seller is influential enough to control a market and exploit other sellers or buyers. This is also because in markets with perfect competition, there is perfect information. Information on the product prices and quality is readily and easily available to all consumers. Therefore, producers have little influence over the market price since any price increase will be made

known to the consumers and would cause a significant fall in quantity demanded for their good as most if not all consumers would switch to relatively cheaper perfect substitutes. Similarly, information on the production processes and technology is readily and easily available to the producers. Therefore, no firm has an exclusive right to technology. As such they all have similar production techniques and firms are unlikely to have any influence over the market.

e. **Price Mechanism at Work**

The price mechanism is used to allocate resources to their various uses. The decisions of producers determine the supply of a good while those of consumers determine demand. The interaction of demand and supply determines the equilibrium price. Changes in the demand and the supply will, ceteris paribus, cause changes in the equilibrium price, which in turn affects resource allocation. In the free market, price plays two important functions:

a) To allocate resources to production.
b) To act as an apportioning device (i.e. to ration goods among buyers).

1.2 ROLES OF THE GOVERNMENT

The various roles of government are shown in Figure 1. Of the four functions highlighted, the **two** in bold circles are **microeconomic objectives – efficiency and equity** – of the government which are covered in this chapter. The two in the dotted circles are macroeconomic roles undertaken by the government which will be discussed in SH2.

Market efficiency is a benchmark used to determine the extent of market failure in the free market. Both productive and allocative efficiencies must be met in order for market efficiency to be achieved. **Allocative efficiency** is achieved when the current combination of goods and services produced and consumed allows the society to attain the greatest level of satisfaction. **Productive efficiency** is achieved when the firms in an economy are producing the maximum output with the given amount of inputs, or producing a given output with the least cost combination of inputs. Only when both forms of efficiencies are achieved can there be an optimum allocation of resources.

However, even though the current levels of production and consumption might be efficient, they might be regarded as unfair. As shown in Figure 1, besides its allocative function, another of the government's microeconomic objective is **equity**, which can be defined as fairness in the distribution of economic welfare. It is worth noting that equitable distribution is not the same as an equal distribution and that different people have different views on what is equitable. In general, we consider a more even distribution of economic welfare as being more equitable compared to one where there are large disparities in welfare between different groups of people in society.

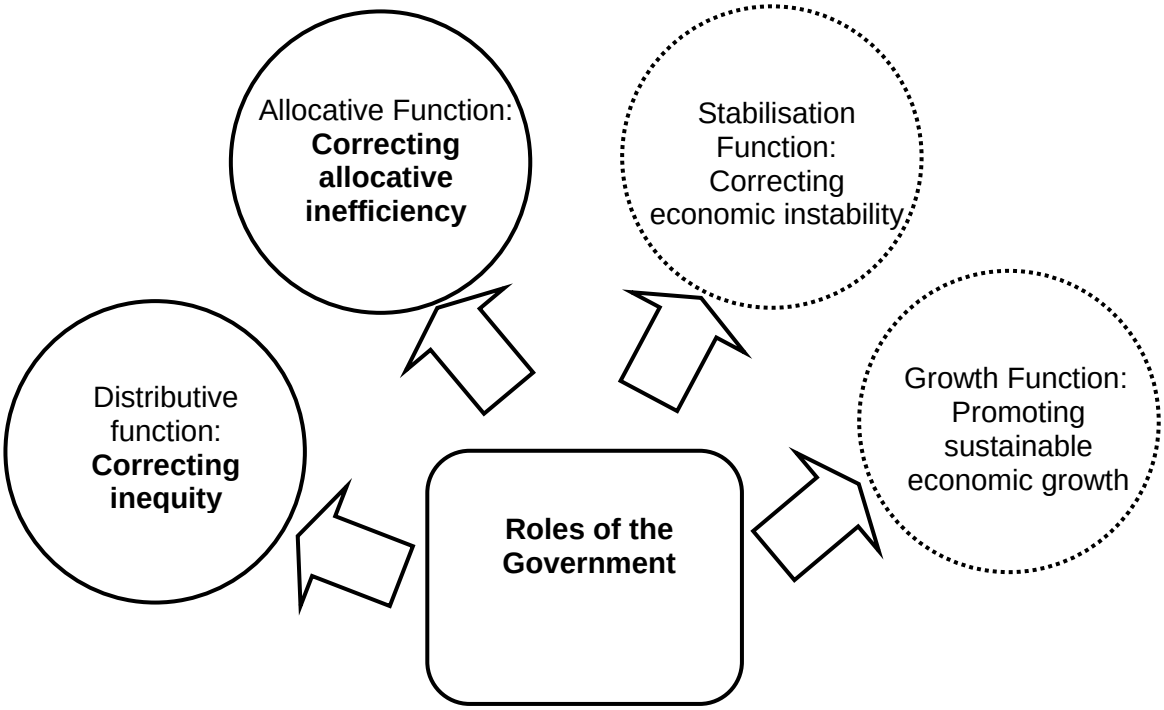


Figure 1: Roles of Government

Now that we have seen an overview of what a free-market economy is, as well as the role the government plays, the following sections will analyse the reasons for the various sources of market failure and the economic rationale for government intervention to help improve resource allocation.

2. MARKET FAILURE

Learning Objectives:

✳ Identify the sources of market failure.

✳ Explain how market efficiency is achieved.

DEFINITION:

Market failure exists when the free market fails to allocate resources in an **efficient** manner (i.e allocative efficiency is not achieved).

The main sources of market failure are:

1. Public goods
2. Externalities
3. Information failure
   a) Imperfect information on costs and benefits
   b) Asymmetric information
4. Market dominance
5. Factor immobility

3. PUBLIC GOODS

Learning Objectives:

- ✳ Explain the characteristics of public goods and their effects on the markets.
- ✳ Explain why the government intervenes in the markets using cost-benefit analysis.
- ✳ Analyse and evaluate (with reference to efficiency and/or equity) how direct provision impacts the achievement of the socially optimal consumption/production level.

DEFINITION:

Public Goods are goods or services that have the features of **non-rivalry, non-excludability and non-rejectability,** and as a result would not be provided by the free market.

These are goods and services which are valuable socially but will not be provided by private enterprises (producers) due to the characteristics of non-rivalry and non-excludability. Thus, the government must take over the role of provision. The government or some public agencies could provide these goods directly. Alternatively, they could pay private firms to do so. Standard examples of public goods: national defence, lighthouses, street lighting, traffic lights, road signs etc.

3.1 CHARACTERISTICS OF PUBLIC GOODS

a) Non-excludability

It is not possible to provide the good or service to only one person without it thereby being available for others to enjoy.

b) Non-rivalry

The consumption of the good or service by an individual does not deplete the benefits available to others to enjoy.

c) Non-rejectability

Non-rejectability means that individuals are unable to choose to forego consumption or prevent themselves from benefitting from the good once it is provided.

3.2 REASONS FOR MARKET FAILURE IN THE PROVISION OF PUBLIC GOODS

3.2.1 NON-EXCLUDABILITY LEADING TO NON-PROVISION OF PUBLIC GOODS

The characteristic of non-excludability means that it is technically impossible or economically unfeasible to exclude anyone from the benefits of the good once it is provided. This is because the good is collectively consumed once it is provided i.e. everyone benefits from it regardless of whether they pay for it or not. As non-paying users usually cannot be excluded from enjoying a public good, suppliers of such goods will find it difficult or impossible to collect fees for the benefits they provide.

An example of public good is street lamp. Once the street lamp has been provided, it would be extremely costly, if not impossible, to switch the street lamp on whenever a payer walks under the lamp and switch it off when a non-payer walks underneath it. It is thus impossible to prevent a passer-by from utilising the light from the street lamp. Once the street lamp is provided, it will benefit everyone who walks under it, irrespective of whether the person has paid for it or not.

Since non-payers would be able to enjoy the benefit of street lighting, no one would have the incentive to pay for the good and they may choose to conceal their preference for the good, leading to the **'free rider' problem**. A free rider is a person who enjoys the benefits of the good without paying for it. This would lead to people not paying for street lighting even though it would benefit the society as a whole. As a result, the demand for the good in the free market is concealed. Hence, street lamps will not be provided by profit-maximising producers as they are unable to determine the price to be charged in the free market. This results in the non-provision of street lamp by private producers, leading to a complete market failure.

DEFINITION:

Free-rider problem is a situation in which an individual is able to enjoy benefits from the consumption of a good or service without having to pay for the consumption of the good or service.

3.2.2 NON-RIVALRY LEADING TO NON-PROVISION OF PUBLIC GOODS

The characteristic of non-rivalry means that the consumption of the good by one person does not reduce the benefit of the good available to others. In the case of street lighting, when one person walks under the street lamp, the level of brightness will be the same as when two or three people were to walk under it. In other words, the level of brightness of the street lighting does not decrease with increasing number of people walking under it.

This means that an additional user does not deplete the supply of a public good and the marginal cost (MC) of providing the good for an additional user is zero. The basic principle of optimal allocation means that the price to charge for the good is equal to its marginal cost (P = MC). With zero marginal cost (MC=0), this calls for provision of public goods and services to anyone who wants them at no charge. However, there would be no private firms willing to produce street lighting at price = 0 because this would mean that they have to provide the street lighting for free, resulting in a missing market and hence a complete market failure. Alternatively, if the good were to be provided by private producers, they would have to charge a price above zero, and hence P > MC and allocative efficiency cannot be achieved.

These two unique characteristics of non-excludability and non-rivalry in public goods affect the decisions made by the economic agents (producers and consumers). For these reasons, we find the government supplying many public goods such as street lights and national defence. Without government intervention, public goods simply would not be provided in the free market.

3.2.3 CHARACTERISTIC OF NON-REJECTABILITY

Non-rejectability means that individuals are unable to choose to forego consumption or prevent themselves from benefitting from the good once it is provided.

Private goods can be rejected by the individuals. If you do not like the soup on the school menu, you can use your money to buy something else!

You can choose not to travel by train and go instead by coach. All private goods and services can be rejected by the final consumer if their taste and preferences or if their budget changes.

Public good is non-rejectable as the collective consumption of a public good by all means that it cannot be rejected by any individual. An example would be a nuclear defence system. Once the defence has been provided by the army, everyone in the population would benefit from it. Consumers cannot be excluded from the protection and consumers are unable to reject the benefits of the defence system.

Non-rejectability thus arises from the collective consumption of the good once it is provided. Whereas non-excludability means that no individual can be excluded from the benefit of the good, non-rejectability means that no individual can choose not to consume or benefit from the good.

3.3 MICROECONOMIC POLICIES: PUBLIC GOODS AND COST BENEFIT ANALYSIS

As mentioned in the previous section, the government **directly provides** (see page 35) for public goods because profit-maximising producers will not provide them. The government is able to increase the output immediately to socially optimum level and control the quality, achieving allocative efficiency in the market. This will not only address the efficiency issue of public good but may also **at times lead to more equitable outcome** as individual will all have equal access to the good regardless of their income level. Hence, as a result of the non-provision of public goods, governments may choose to directly provide the good. For example, some governments provide free television broadcast for education purposes (e.g. PBS).

The next question to ask would then be for the government to decide what public goods to produce and in what quantities. As part of decision-making process, the government makes use of **cost-benefit analysis (CBA)** to decide which projects to undertake.

Generally, the government adopts CBA to help decide whether or not to go ahead with any particular public project or which alternative projects to choose. The benefits should include direct benefits to the society or group of people whom the project is targeted at and any secondary benefits to the society, both present and future, while the costs include all opportunity costs involved in the project, as well as any unintended consequences that need to be taken into consideration, both current and future. The analysis seeks to establish whether the benefits to society from the project outweigh the costs, in which case the project should go ahead; or whether the costs outweigh the benefits, in which case it should not.

LIMITATIONS

The government may have **difficulties determining the actual benefits and costs of provision** without the price mechanism. This may lead to the government over-providing for the good/service, which would lead to inefficiency. For example, the free healthcare provided by the National Health Services in the UK has led to an overuse of healthcare services and resulted in inefficient use of resources.

4. PRESENCE OF EXTERNALITIES

Learning Objectives:

- ✳ Use examples of positive externality to illustrate and explain the divergence between private and social benefits leading to market failure.
- ✳ Use examples of negative externality to illustrate and explain the divergence between private and social costs leading to market failure.
- ✳ Analyse and evaluate (in relation to efficiency and/or equity) how taxes and subsidies, tradable permits, and rules and regulation impact the achievement of the socially optimal consumption/production level of goods and services with externalities.

DEFINITION:

An externality occurs when some of the costs or benefits associated with the production or consumption of a good 'spills over' onto third parties, that is, to parties other than the immediate seller or buyer, for which no compensation is paid.

Examples of externalities include:

Negative externalities from production – This occurs when costs are imposed on third parties (external costs are imposed on the society) from the production of a good or service by private firms (producers), e.g. air pollution by factories, water pollution from the dumping of toxic industrial waste or agricultural waste that may destroy marine ecological system (for example. fishes are destroyed or become unfit for consumption thereby depriving fishermen of their catch).

Positive externalities from production **-** This occurs when benefits accrued to third parties (external benefits are accrued to the society) from the production of a good or service by private firms (producers), e.g. research & development, where the knowledge gained from it can be used by other firms for improvements in their products or production processes.

THINK ABOUT IT:

Can you think of examples for the following?

(i) Negative externality from consumption

(ii) Positive externality from consumption

The private decision-maker (consumers and/or producers) does not account for these external costs or external benefits. In the presence of externalities, markets will fail to allocate resources in a socially efficient manner as there is a divergence between private and social costs/benefits.

Terminology

Private cost: Costs incurred by those who directly produce or consume a good. It measures the value of the next best alternative use of the inputs available to private consumers or producers; borne solely by the individuals who incur them.

External cost: Costs associated with the production or consumption of a good which 'spills over' onto third parties, that is, to parties other than the immediate seller or buyer. Third parties are not compensated for the spillover costs inflicted on them.

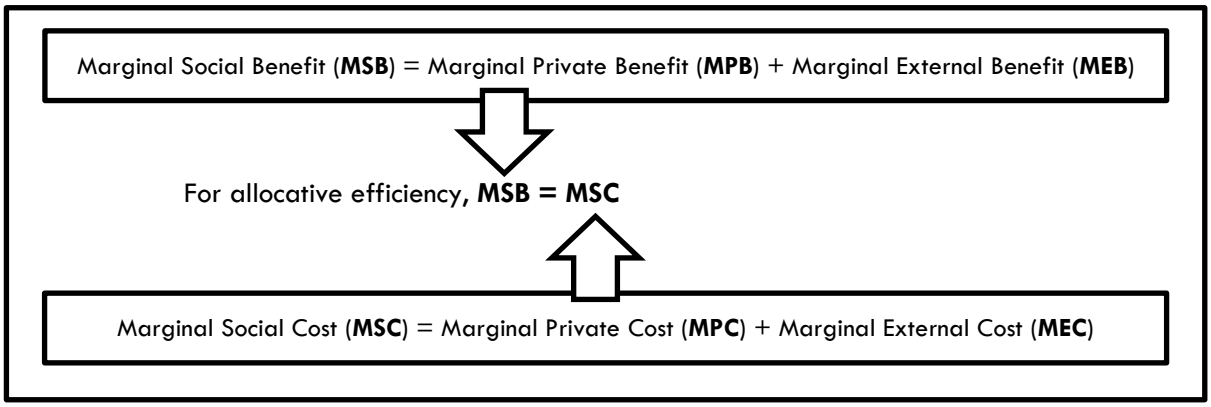
Social cost: The cost to the society, i.e. to all individuals in the society; it consists of both private and external costs. Marginal Social Cost is equal to sum of Marginal Private Cost and Marginal External Cost (MSC = MPC + MEC).

Private benefit: The satisfaction/ reward that an individual or firm is able to obtain from the direct consumption or production of a certain good/service.

External benefit: Benefits associated with the production or consumption of a good which 'spills over' onto third parties, that is, to parties other than the immediate seller or buyer.

Social benefit: The total gain in welfare by the whole of society from the consumption or production of a certain good/service by a private individual or firm; Marginal Social Benefit is equal to sum of Marginal Private Benefit and Marginal External Benefit (MSB = MPB + MEB).

According to the marginalist principle and assuming that there are no external costs or benefits to society or any other form of market failure, under a free market system when the decisions are left to private individuals, allocative efficiency will be achieved when Marginal Social Benefits (MSB) is equal to Marginal Social Costs (MSC).



For simplicity, assuming that MEB = 0 and MEC = 0, then there is no over- or under-production/consumption when MSB is equal to MSC at the socially optimal level of production/consumption.

THINK ABOUT IT:

Why is allocative efficiency achieved when MSB = MSC?

However, in the free market where decisions are left to private individuals may fail because with the existence of externalities, the price system may not take into account all the costs or benefits associated with the consumption or production of a particular good/service. Since social cost or benefit may not always equal private cost or benefit, a socially efficient allocation of resources may not be achieved even in a free market economy. Too much or too little of the good or service may be consumed or produced.

RECALL:
Allocative efficiency is achieved when the current combination of goods and services produced and consumed allows the society to attain the greatest level of satisfaction. Society's welfare, as represented by the sum of consumer and producers' surplus is maximised.

For example, if MSB > MSC, then society's marginal valuation (marginal benefit) of the last unit of a good/service is more than the additional cost that is incurred for it. Therefore, society will be better off in terms of welfare if more resources were allocated towards the production and consumption of additional units of that good.

As output increases, MSC increases and MSB decreases. This process will continue until MSB equals MSC, thus achieving allocative efficiency.

4.1 NEGATIVE EXTERNALITIES

7 Steps to explain with depth on negative externality diagram:

1) When left to the free market, private producers/consumers produce/consume at MPB=MPC.
2) Explain MPB and MPC in context
3) Explain MEC in context
4) Explain the divergence between MPC and MSC due to the presence of MEC. Assume no positive externality, MPB=MSB
5) When left to the free market, private producers/consumers produce/consume at Qp where MPB=MPC; However, the socially optimum output is at Qs: where MSB=MSC. Producers/consumers fail to internalise the external costs.
6) Since Qp>Qs, there is overproduction/over-consumption of goods leading to allocative inefficiency
7) Explain area of DWL → resulting in market failure

Negative externalities occur when private consumption/production creates an external cost to the society (affects parties as a 'spill-over effect') that is not internalised by private consumers and/or firms. This results in a divergence between marginal private cost and marginal social cost. Examples of negative externality include restaurant releasing smelly fumes near housing units, sleep deprivation due to a neighbour listening to loud music late at night.

Let us look at an example to determine the welfare loss to society resulting from negative externalities. We will examine the case when a firm that manufactures polymer fibres causes water pollution.

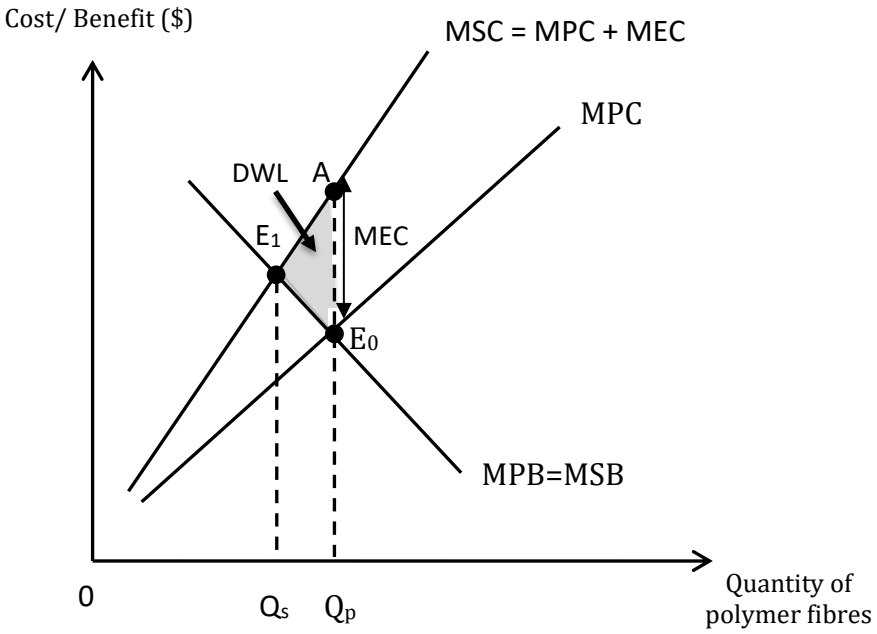


Figure 2: Negative Externality resulting in Allocative Inefficiency

✳ In the free market, as producers are self-interested, they will only consider their marginal private benefit (MPB) and marginal private cost (MPC) to maximise their profits.

✳ MPB is the additional revenue the producers will receive for producing (and selling) an additional unit of polymer fibre, while MPC is the additional labour and raw materials cost for producing an additional unit of polymer fibre.

- The production of polymer fibres generates external costs to the third parties such as fishermen and society through the loss of marine lives and fishermen's livelihood as the release of mercury into the water kills the fish in the water.
- Due to the presence of external costs, there is a divergence between the marginal private cost (MPC) and the marginal social cost (MSC) by a distance equal to the marginal external cost (MEC), where MSC=MPC+MEC. Assuming no positive externalities, MEB=0, thus MSB=MPB, as MSB=MPB+MEB.
- With reference to Figure 2 above, when left to the free market, self-interested private producers will produce $0Q_P$ units of polymer fibres, where MPB=MPC. However, the socially optimal level of polymer fibre production is where MSB=MSC at the level of $0Q_S$ units.
- The free market has actually resulted in an overproduction of polymer fibres by Q_SQ_P units. Society would actually be better off if these units of polymer fibres were not produced. At the free market equilibrium, the marginal social cost of producing $0Q_P$ units of polymer fibres is given by point A but the marginal social benefit to society is lower at E_0. This means that society actually values the production of the Q_Pth unit of polymer fibre less than what it costs society to produce it. This is true for all units of polymer fibre from Q_S to Q_P where the value that society places on the polymer fibres is less than the cost to society.
- The additional cost to society of overproducing the good is area $Q_SE_1AQ_P$, while the additional benefit to society of producing Q_SQ_P is area $Q_SE_1E_0Q_P$. The welfare loss to society due to the overproduction is thus represented by area E_1AE_0 in Figure 2 above. The firm has failed to internalise the external costs, hence there is an overproduction, which results in allocative inefficiency causing a deadweight loss to society (i.e. total welfare to society is less than the socially optimal). To achieve allocative efficiency, output should be reduced to $0Q_S$ units.

4.2 MICROECONOMIC POLICIES: NEGATIVE EXTERNALITIES

Governments may carry out a combination of the following measures to correct for the presence of negative externalities. These solutions can be broadly classified as **market-based solutions** and **non-market based solutions** such as command-and-control policies.

Market-based solutions work through the market by changing the market signals (prices) to reflect the true cost to society. Non-market based policies on the other hand make use of regulations and laws to limit the amount of the negative externality.

MARKET BASED SOLUTIONS

a. Taxation

The government can levy a **specific** tax **at the socially optimal level of output** that approximates the value of external costs (MEC) generated per unit of output. Taxes enacted to correct the negative externalities are also called Pigouvian taxes. Through this tax, the government attempts to make the private economic agents **internalise the external costs**.

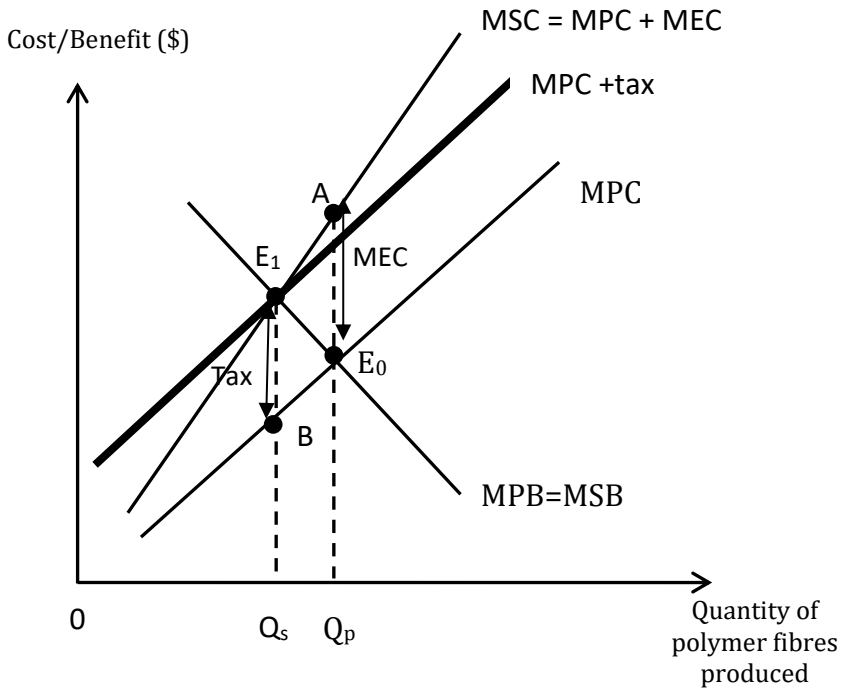


Figure 3: Internalising negative externality through taxation

In Figure 3, a **specific tax that is equal to BE_1 per unit** will increase the firm's unit cost, shifting the MPC curve upwards to (MPC + tax), which coincides with the socially optimal equilibrium of E_1. The result is that the private equilibrium output will decline as consumers will now consume at MPC+tax = MPB. Private equilibrium output level now corresponds with the socially optimum level of output of $0Q_S$ units. There would therefore be no over-production of the good as MSB = MSC and allocative efficiency is attained.

The reduction in output results in the removal of the deadweight loss to society represented by area AE_0E_1 as the gain due to the reduction in production represented by area $E_1AQ_PQ_S$ offsets the loss due to the reduction in consumption represented by area $E_1E_0Q_PQ_S$. Taxation thus acts as a form of corrective measure to solve market failure in an imperfect market. However, it is important to note that taxation will distort the price mechanism in a perfect market if there is no externality.

The advantage of taxation includes **giving incentives to firms to find cleaner ways of production**. Profit-maximising firms will have the incentive to conduct research and development to reduce marginal external cost (MEC), in order to reduce the tax amount they have to pay. The reduction in tax will hence reduce cost of production and thus increase profit levels earned by the firm. Thus, tax acts as an incentive over the longer run to reduce pollution. In addition, it is **a source of revenue for the government**. The additional tax revenue collected could also be used to conduct research and development to reduce pollution level in the polluting industry.

LIMITATIONS

Firstly, there is a **problem of assessing the exact monetary value of external costs at the socially optimal level of output** (e.g. measuring the external costs generated by negative externalities like noise pollution), which in turn implies that the appropriate level of tax is difficult to determine. Too high a tax amount would lead to a less than optimal level of output, while too low a tax amount would still result in over-production. For instance, a tax imposed at output $0Q_P$ (where tax amount = AE_0) will result in overtaxation and underproduction.

Secondly, the **administrative costs of collecting the tax may be very high**. Firms may also have the incentive to evade such taxes.

Thirdly, a tax may also have unintended consequence which is a **regressive effect on lower income groups**. Goods that have a price-inelastic demand (e.g. basic food that is a necessity) would lead to the lower income group having to pay higher tax in relation to their incomes. This is because the quantity demanded of such goods do not change a lot in respond to the change in price (due to the tax). This lead to the higher and lower income groups paying similar amount of the tax absolutely, but the lower income group pays more as a percentage of their incomes.

EXAMPLE OF CORRECTING NEGATIVE EXTERNALITY IN CONSUMPTION THROUGH TAXATION AND SALIENCE EFFECT

ELECTRONIC ROAD PRICING IN SINGAPORE

What is ERP?

The Electronic Road Pricing (ERP) system is used to manage road congestion. It was implemented by the Land Transport Authority (LTA) in September 1998 to replace the Singapore Area Licensing Scheme. It is based on a pay-as-you-use principle. ERP gentries are usually located at roads leading to areas with heavy traffic as well as the city areas to collect road usage charges, especially during peak hours. The main purpose of this system is to reduce the number of cars entering the congested roads.

How does ERP work?

Based on economic analysis, ERP charge has to be equal to MEC at socially optimum output ($0Q_S$) to fully internalise the negative externality. This will lead to an increase in the car owner's unit cost, shifting the MPC curve upwards to coincide with the socially optimal equilibrium of E_1. As shown in figure 4, the market equilibrium output will decline to correspond with the socially optimum level of output of $0Q_S$ units where there will be no over-consumption of cars as MSB=MSC.

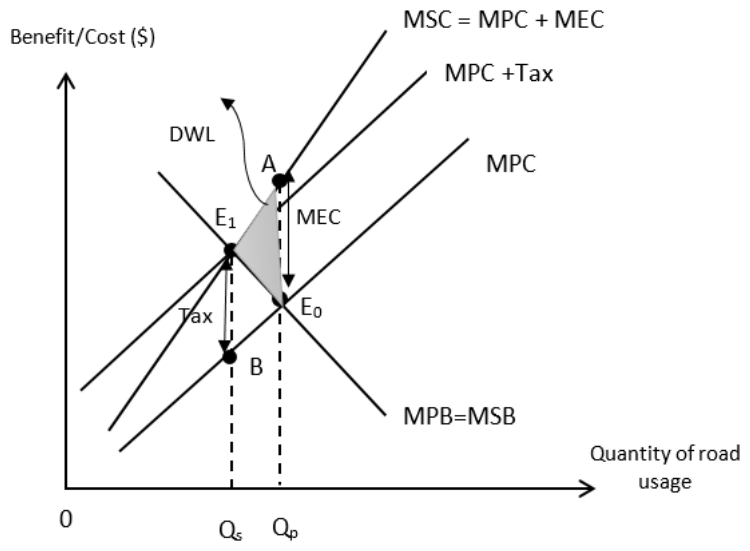


Figure 4: Internalising negative externality through ERP charges

Salience Effect

In addition, there is a salience effect when the In-Vehicle Unit (IU) in which a cash card is inserted beeps every time the car passes through an ERP gantry. The amount deducted from the cash card is then shown on the IU screen. This has the effect of causing the motorist to be more conscious of the cost of driving on the road and may thus cause him to reduce his usage of the road, thus reducing traffic congestion.

b. Tradable Permits

The system of tradable permits is a combination of command-and-control and market-based system of resolving externalities. Each firm is given a permit to emit given level of pollution. If the firm emits less pollution than what they are legally permitted to, the firm is given a credit. This credit can then be sold to another firm, allowing the other firm to exceed its original limit. Similar to Pigouvian taxes, polluting firms internalise the externality of pollution as there is an opportunity cost of polluting (i.e. what they could receive by selling their permits).

Hence, we observe that the overall level of emissions is determined by a command-and-control method, whereas their distribution is determined by the market.

The principle of tradable permits can be used as the basis of international agreements on pollution reduction. Each country could be required to achieve a certain percentage reduction in a pollutant (e.g. CO_2 or SO_2), but any country exceeding its reduction could sell its right to these emissions to other (presumably richer) countries.

A similar principle can be applied to the use of natural resources. For example, fish quotas could be assigned to fishing boats or fleets or countries. Any parts of these quotas not used could then be sold.

The main advantage of tradable permits is that the **government can determine definitively the total amount of permitted discharge according to the ability of the environment to absorb the pollutants**; it can do this without any knowledge of the specific costs and benefits of individual firms. The market in tradable permits can then allocate the reduction in pollution to where it can achieve at least cost thus promoting efficiency. Firms that are able to reduce pollution at a lower cost compared to the cost of buying the permits in the market will have the incentive to reduce their pollution level and sell their excess permits. Firms that incur higher costs in reducing pollution compared to the cost of the tradeable permits will find it more economical to buy the permits from the market instead of implementing the pollution control measures at higher cost. In this way, the **overall pollution is reduced in the most efficient or least cost manner**.

LIMITATIONS

Firms which find that the cost of the permits is lower than their abatement costs (costs of eliminating pollution), would buy more permits to pollute. As such, these **firms might not have the incentive to reduce pollution**. Noting this, a cost-benefit analysis can be carried out and tradable permits may not be appropriate if the reduction in pollution brings about small benefits and yet results in significant abatement costs.

Another issue of this system is **deciding how to allocate the permits to firms**. If there are many polluting firms, regulators would be concerned about the administrative costs. It is also possible that one or two dominant firms may buy up permits in the market and refuse to trade them. This would then act like a barrier to entry for new firms and the permits could therefore contribute to non-competitive behaviour. There could also be **enforcement issues** as it means that the government would need to monitor and keep track of the amount of pollution produced by each firm to determine whether it is within the permitted levels, and determine the amount of credits each firm can sell or need to purchase. The administrative costs of monitoring the pollution levels of firms and taking enforcement actions on those that violate the permitted levels of pollution could be significant.

NON-MARKET BASED SOLUTIONS

c. Quotas

Quotas aim to set the level of consumption or production of an activity or good to the socially optimal level, achieving allocative efficiency. The main advantage of quota is that there will be **higher certainty in terms of the outcome**. For example, if the government knows the output that is socially optimal, it can just set the quota at that level. This is in comparison to taxation where the government may not know how economic agents would react to the tax, thus less certain about the level of tax to impose to achieve the socially optimal output. **A quota may also be a better option in situation that is very dire and urgent** (e.g. extremely high level of pollution that endangers lives) because of the certainty of its outcome and the speed it can be implemented.

LIMITATIONS

Being a policy that has high level of command and control, the main limitation of quota is the **enforcement and monitoring costs**. The government will need to incur costs to ensure that producers/consumers abate by the quota. Costs may also need to be incurred by these private economic agents as part of this monitoring and enforcement process. For example, firms may need to incur costs to submit reports showing that they are producing within the quota.

d. Legislation or government regulation

Government regulation is the process of controlling business activities through laws and administrative rules. The government can pass legislation to prohibit or regulate behaviour that imposes external cost. To prohibit or limit pollution for instance, legislation can be used in forcing potential polluters to bear the costs of more proper disposal of industrial wastes. Such action forces potential offenders, under the threat of legal action, to bear all the costs associated with their production. Thus, polluting firms will then internalise the external costs, reducing the difference between MPC and MSC. Another example of legislation is the complete ban of an activity or the sale or consumption of a good. This will then result in the elimination of the external costs, since there is zero consumption or production of the good.

The advantage of regulations is that **they are simple and clear to understand and are often relatively easy to administer**. Inspectors or the police can conduct spot checks to see that the law is being obeyed.

LIMITATIONS

The problem with using legislation or some form of government regulation is that **enforcement of such laws or regulations may be difficult and expensive**. The regulatory agency has to check factory by factory, firm by firm, how much and what kinds of pollutants are being emitted. In addition, for the law to be effective, the penalties for breaking the law must be sufficiently harsh.

Moreover, the **methods adopted to control pollution may be costly and must be included as part of the social costs of production**. Hence, government agencies must estimate accurately the impact of their regulations in order to achieve the socially ideal level of production. Also, it tends to be a rather blunt weapon. **Firms have no incentive to reduce pollution further than what is required by the law**. If the regulation is too stringent e.g. a complete ban, it may result in over-correction of the market failure and greater deadweight loss, as the good may become under-consumed instead.

e. Education, campaigns and advertisements

Such measures allow the external cost from the consumption of certain goods to be made known to the individuals. It is hoped that, as a result of the moral suasion, consumption for these goods would be discouraged because individuals would internalise the external cost. This can be effective if individuals are altruistic and find satisfaction in benefitting others. Hence, individuals will take into consideration the MEC on their own accord and make decisions based on the MSC. **One major advantage of this is that if implemented effectively, mindsets would be changed and the effects would be long-lasting,** thus no continuous measures need to be put in place.

LIMITATIONS

However, the benefits from these measures must outweigh the costs of implementing them. **The effectiveness of public education and campaigns is rather uncertain and difficult to measure**. Furthermore, **changing mindsets through such means takes time**, thus if the problem is serious, urgent and life-threatening, this may not be the best policy to use.

EXAMPLE OF CORRECTING NEGATIVE EXTERNALITY THROUGH QUOTAS

CERTIFICATE OF ENTITLEMENT (COE) IN SINGAPORE

What is COE?

Anyone who wishes to purchase a new vehicle in Singapore must first obtain a Certificate of Entitlement (COE) in the appropriate vehicle category. A COE represents a right to vehicle ownership and use of the limited road space for 10 years. At the end of the 10-year COE period, vehicle owners may choose to deregister their vehicle or to revalidate their COEs for another 5 or 10-year period by paying the Prevailing Quota Premium.

How does COE work?

COE is a form of quota which aims to set the car ownership to the socially optimal level and the vehicle owners have to bid in order to get the COE. The price of COE is determined by demand and supply. While demand is determined by the number of vehicle owners who wish to purchase a new vehicle, supply is fixed which is set by the government. With COE, the MPC of owning the car increases and the car owners are forced to internalise the negative externality. Since COE prices are determined by market forces, COEs are allocated efficiently to potential car owners who are willing and able to pay the high costs involved.

However, the effectiveness of the COE may be affected by the sunk cost fallacy (This will be explored in the later section). Moreover, if COE prices become too high, equity issue may then come in as the middle-income households may now find owning a car less affordable. Furthermore, despite the quota set, it is difficult to ensure that consumption is at the socially optimum level at all times as it is hard to control the car usage.

7 Steps to explain with depth on positive externality diagram:

1) When left to the free market, private producers/consumers produce/consume at MPB=MPC.
2) Explain MPB and MPC in context of the question
3) Explain MEB in context.
4) Explain the divergence between MPB and MSB due to the presence of MEB. Assume no negative externality, MPC=MSC
5) When left to the free market, private producers/consumers produce/consume at Qp: where MPB=MPC; However, the socially optimum output is at Qs: where MSB=MSC. Producers/Consumers fail to internalise the external benefits.
6) Since Qp<Qs, there is underproduction/under-consumption of goods leading to allocative inefficiency
7) Explain area of DWL → resulting in market failure

4.3 POSITIVE EXTERNALITIES

The same framework can be used to analyse the welfare loss arising from the presence of positive externalities in a market. For example, consider the case of consumption of healthcare (see Figure 5).

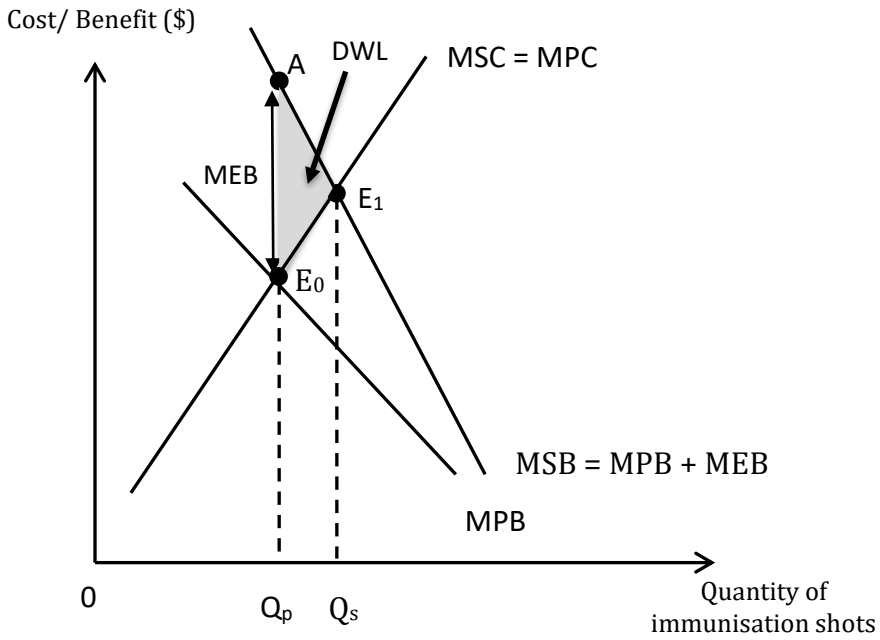


Figure 5: Positive Externality Leading to Allocative Inefficiency

✳ In the free market, as consumers are self-interested, they will only consider their marginal private benefit (MPB) and marginal private cost (MPC) to maximise their satisfaction.

✳ MPB is the additional benefit in terms of better immunity system the consumer will receive for consuming an additional unit of immunisation shot, while MPC is the additional medical cost for consuming an additional unit of immunisation shots.

✳ The consumption of immunisation shots generates marginal external benefits (MEB) to the third parties such as the prevention of third parties such as family members and friends from falling sick, reducing work and school absenteeism that thereby contributes to an increase in productivity of the nation.

✳ Due to the presence of external benefits (MEB), there is a divergence between the marginal private benefit (MPB) and the marginal social benefit (MSB), where MSB=MPB+MEB. Assuming that the external cost is negligible (i.e. MEC=0, thus MSC=MPC, as MSC=MEC+MPC).

- With reference to Figure 5 above, when left to the free market, the private consumers will consume $0Q_P$ units of immunisation shots, where MPB=MPC. However, the socially optimal level of immunisation shots consumption would actually be where MSB=MSC at the level of $0Q_S$ units.
- The free market has actually resulted in an underconsumption of immunisation shots by Q_SQ_P units. Society would actually be better off if these units of immunisation shots were consumed. At the free market equilibrium, the marginal social benefit of consuming $0Q_P$ units of immunisation shots is given by point A but the marginal social cost to society is lower at E_0. This means that society actually values the consumption (marginal social benefit) of the Q_Pth unit of immunisation shots more than the cost (marginal social cost) for it. This is true for all units of immunisation shots from Q_S to Q_P where the value that society places on the immunisation shots is more than the costs to society.
- The additional benefit to society of consuming the good is area $Q_SE_1AQ_P$, while the additional cost to society of consuming Q_SQ_P is area $Q_SE_1E_0Q_P$. The welfare loss to society due to the underconsumption is thus represented by area E_1AE_0 in Figure 5 above. The consumer has failed to internalise the external benefit, hence there is an underconsumption which results in allocative inefficiency causing a deadweight loss to society. (i.e. total welfare to society is less than it should be). To achieve allocative efficiency, output should be increased to $0Q_S$ units.

4.4 MICROECONOMIC POLICIES: POSITIVE EXTERNALITIES

Governments taking into account positive externalities may adopt the following **market-based** and **non-market based** measures:

MARKET BASED SOLUTION

a. Subsidies

A subsidy is a negative tax; it is a payment made either to a firm or to a consumer when the firm produces or when the consumer buys a good or service. Examples of subsidies include public subsidisation of education, mass immunisation programmes and public health.

Through an **indirect subsidy to the firms** or a **direct subsidy to households,** the government will be able to stimulate either MPC or MPB respectively such that efficiency is achieved. A subsidy to either the firms or the households will increase production or consumption respectively to the socially optimum level of output.

DIRECT SUBSIDY

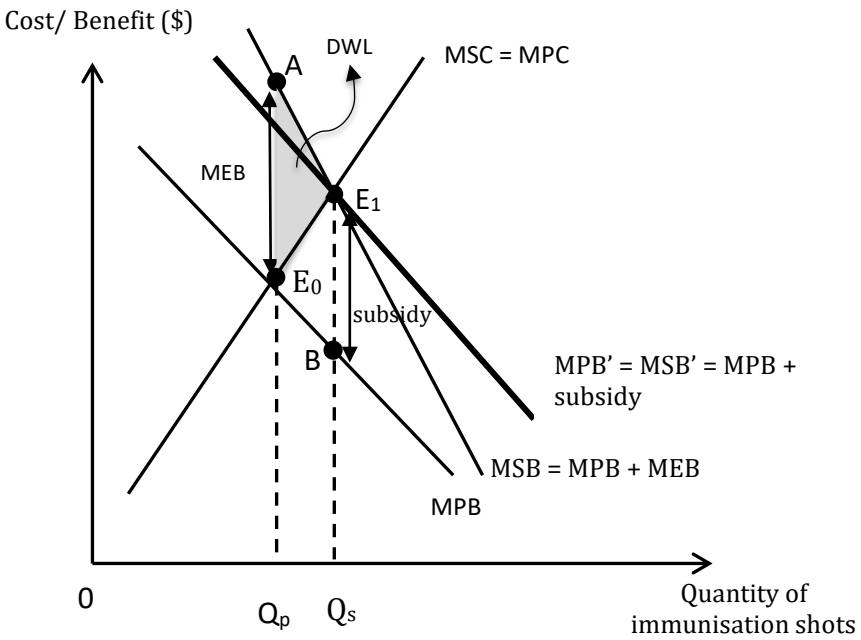


Figure 6: Internalising positive externality by providing direct subsidy to *consumers*

In Figure 6, a **direct subsidy amount that is equal to the MEB at the socially optimal level (E_1B)** is given to consumers to encourage them to obtain immunisation shots. The direct subsidy causes the MPB to shift upwards to a new MPB' where MPB' = MPB + subsidy. Consumers now consume at where MPB'=MPC, which coincides with the socially optimal level of OQ_S. Allocative efficiency is thus attained.

Cash coupons in the form of direct subsidies are used to ensure that the direct subsidy is used for its purpose. A direct subsidy can help to improve equity, especially if it is differentiated according to income levels i.e. lower income households are given a higher quantum of subsidies. However, administrative costs of implementing such schemes would be high.

INDIRECT SUBSIDY

Alternatively, the government can provide **indirect subsidies** to the producers and hence lower the MPC and stimulate production. In Figure 7, an indirect subsidy of E_1B is given to producers, causing the MPC to shift downwards to MPC + subsidy. This indirect subsidy will lower the price of the good, thus helping to increase consumption by Q_PQ_S. Consumers will now consume at Qs, where MPB= MPC + subsidy thereby attaining the socially optimum level of output at Q_S.

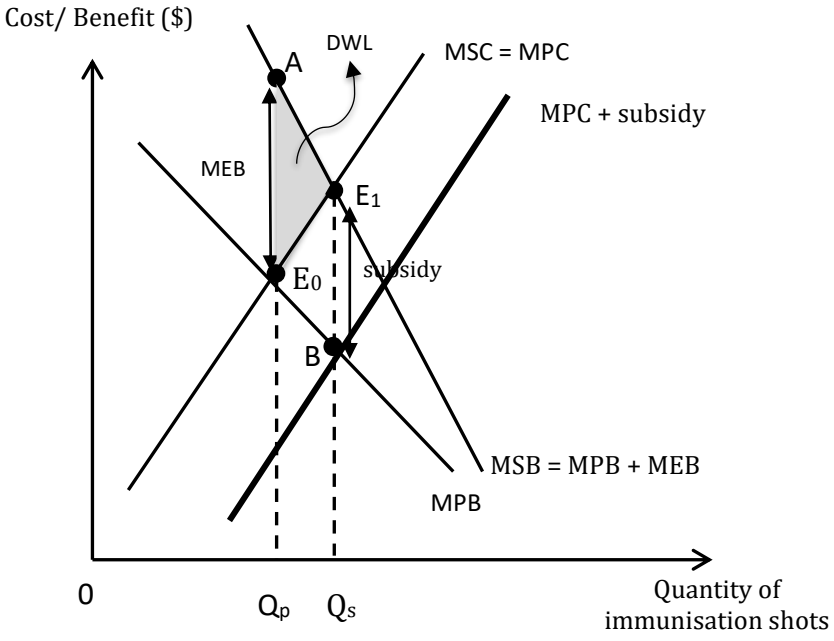


Figure 7: Internalising positive externality by providing indirect subsidy to *producers*

In both instances, the direct or indirect subsidy will result in the removal of the deadweight loss to society represented by area AE_1E_0, as the gain from the increased in consumption, as represented by area $AE_1Q_SQ_P$, offsets the increased cost represented by area $E_0E_1Q_SQ_P$. Note that a direct subsidy given to consumers increases demand for the good (causing a shift in MPB) whereas an indirect subsidy given to producers reduces the private cost of production and thus price of the good, causing an increase in quantity demanded.

By lowering the price of the good, an indirect subsidy also **helps to improve equity, as it makes the good more affordable to the lower income.** This ensures that the essential good such as education or healthcare is also accessible to the lower income households.

LIMITATIONS

The limitations of using subsidies to resolve externalities depend on the ways in which (either through increased taxation or borrowing) the increased government expenditure can be financed. Such **subsidies can be a strain on the government budget** and have an opportunity cost in terms of other areas in which the government funds could be spent. This could also have welfare implications e.g. reduction in spending on healthcare. **The implications of raising taxes or government borrowing to finance its expenditure will be covered under macroeconomics**. In addition, it is also **difficult to assess the exact monetary values of the MEB.** Over or under estimation of the MEB could result in the government giving too much or too little subsidies, which in either case, will still result in deadweight loss.

THINK ABOUT IT:

In practice, it is more convenient to subsidise producers rather than consumers. Why?

NON-MARKET BASED SOLUTIONS

b. Legislation or Government Regulation

Legislation and regulations are relatively easier to implement. Examples include laws on compulsory education. The **problem with all legislation/regulation is in enforcement**. Constant checking is needed and this can translate into high costs for the government. (See page 28)

c. Direct Provision

Government directly provides the good or service to increase the production to the socially optimal level, Qs. For example, in Singapore, there is direct provision of primary school education where the government provides the school buildings and hire the teachers. With the direct provision, the government **can increase the output immediately to the socially optimum level and control the quality**. Direct provision often involves subsidy as well, since the government may provide the good or service for free or charge only a nominal sum. Besides achieving allocative efficiency, **it thus also addresses the issue of equity by ensuring that the good is affordable and accessible to the lower income.**

LIMITATIONS

However, there may be **greater inefficiency with government direct provision due to the lack of competitive pressure and profit motive.** The government may also have to **increase funding through increased taxes and borrowing where high opportunity cost will be incurred.**

d. Joint Provision

Joint provision is where the government employs private firms to carry out parts of the provision of the goods with positive externalities while it remains as the sole provider. For example, under Land Transport Authority (LTA), the government owns the assets of the train and bus companies and builds the infrastructure while the private firms will bid for the contracts to run the service. This is also known as Private-Public-Partnership (PPP).

With joint provision, the government can increase output to the socially optimum level and also monitor and control the price and quality. There is more incentive to be efficient due to competitive pressure and private firms' profit motives.

LIMITATIONS

However, the government may face **difficulty in monitoring and enforcing the quality standards**. The government will also have to **increase funding through increased taxes and borrowing where high opportunity cost will be incurred**.

e. Education, Campaigns and Advertisements

Governments can undertake these measures to encourage the consumption or production of such goods by informing the public of the benefits of the good. Such public campaigns can make use of the **salience effect** to influence people's behaviour and nudge them into consuming more of the good with positive externality. For example, the government may put up posters or show video advertisements on TV or YouTube to highlight the benefits of vaccination to society at large. This can help make vaccination more salient in the minds of people, thus inducing them to take the step of getting themselves vaccinated. This can be effective if individuals are altruistic and find satisfaction in benefitting others. Hence, these individuals will take into consideration and internalist the MEB on their own accord and make decisions based on the MSB.

LIMITATIONS

However, the **effectiveness is uncertain as this is on a purely voluntary basis**. The effectiveness of education depends on the receptiveness of the consumers and the effect is only seen in the long run. Moreover, the **costs of implementing public education campaigns** in terms of resources and time could be substantial, such as TV advertisements, organising events and talks, producing posters, banners and educational materials, etc.

Note: The costs of implementing public education could differ depending on the types of education materials being implemented. Publicity through advertisements on media platforms would be relatively more costly as compared to publicity via posters and banners.

5. INFORMATION FAILURE

Learning Objectives:

- ✳ Analyse why imperfect information can lead to allocative inefficiency.
- ✳ Use imperfect information on the true costs of consumption of a good to explain the divergence between perceived marginal private cost and actual marginal private cost leading to market failure.
- ✳ Use imperfect information on the true benefits of consumption of a good to explain the divergence between perceived marginal private benefit and actual marginal benefit leading to market failure.
- ✳ Use real-world examples to illustrate and explain adverse selection and moral hazard.
- ✳ Analyse and evaluate (in relation to efficiency and/or equality) how microeconomic policies impacts the achievement of the socially optimal consumption/production level

In the study of perfect competition, it is generally assumed that consumers and firms have perfect knowledge of costs and benefits. In the real world, there is often a great deal of ignorance and uncertainty.

Firstly, information failure exists when some, or all, of the participants in an economic exchange do not have perfect knowledge.

Secondly, information failure exists when one participant in an economic exchange knows more than the other, a situation referred to as the problem of asymmetric, or unbalanced, information.

Imperfect information may prevent economic agents from consuming or producing at the levels that would maximise their welfare and they would otherwise choose. There is likely to be a misallocation of scarce resources, with consumers paying or consuming too much or too little, and firms producing too much or too little.

5.1 IMPERFECT INFORMATION ON COSTS AND BENEFITS

NOTE:
In the previous syllabuses for H1 & H2, the terms 'merit good' and 'demerit good' were taught in the syllabus and below are their definitions:

Merit goods are goods and services that usually generate positive externalities when consumed by the economy. These are goods that the government feels are socially desirable and people will underconsume, possibly because of imperfect information, where individuals lack information of the full benefits of consumption.

Demerit goods are goods and services, which consumption is considered to be socially undesirable, usually possess negative externalities and that the government feels people will overconsume, possibly due to imperfect information on the true costs the good imposes.

*In the current syllabuses, the terms 'merit good' and 'demerit good' are **NOT** included in the syllabus. However it will still be good to be aware of these two terms as you might come across them in resources such as seminar worksheets, past years' papers etc.*

Market failure arises when consumers fail to act in their own best interests because of lack of information. Consumers may not be aware of the true private costs or benefits of consuming the good. This may result in sub-optimal choices by consumers, thus resulting in allocative inefficiency.

5.1.1 IMPERFECT INFORMATION ON THE COSTS OF CONSUMPTION OF A GOOD

Goods such as cigarettes, gambling and street drugs, can have adverse effects on an individual's well-being when consumed. They are goods, which people may over consume, possibly because of **imperfect information**. This means that individuals lack information of the full costs of consumption.

Let us look at an example of consumers' overconsumption of cigarettes due to **imperfect information**.

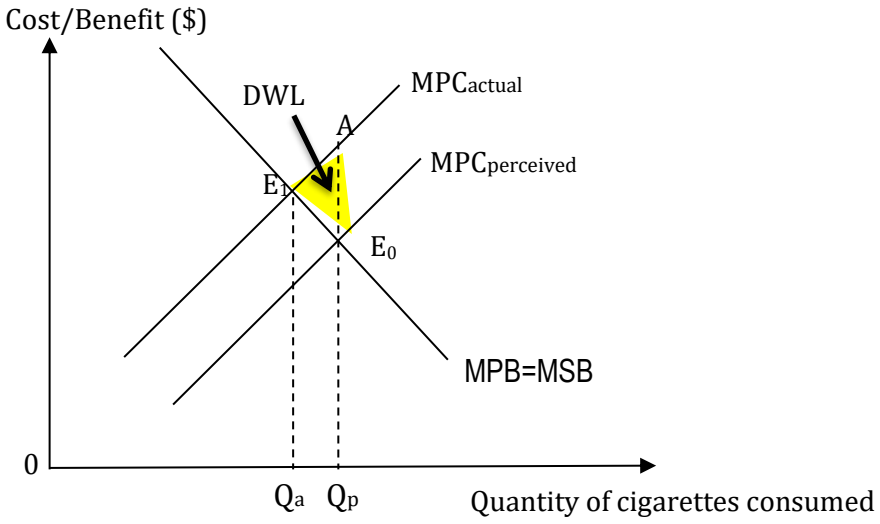


Figure 8: Imperfect information about the actual cost of consumption resulting in allocative inefficiency

Goods like cigarettes can be over-consumed because consumers are not fully aware of the longer-term health implications of their consumption decisions. When smokers decide to smoke for thrill purposes or under peer pressure, they do not have full information about their **actual MPC** or may underestimate the chances of being affected by smoking-related illnesses, medical problems and possibly death.

As shown in Figure 8, because consumers may be unaware of the actual costs of consuming these goods, the quantity consumed for cigarette is at $0Q_p$, where MPB=MPCperceived. However, had consumers been better informed, the quantity of cigarette to be consumed will be at $0Q_a$, where MPB=MPCactual. The gap between $0Q_a$ and $0Q_p$ represent the **over-consumption** (of cigarettes) **due to imperfect information**.

The additional cost to the society for overconsuming the good is QaE1AQp, while the additional benefit is QaE_1E_0Qp. The welfare loss due to the overconsumption is represented by area E_1AE_0 in the figure above. Due to imperfect information, there is **allocative inefficiency** resulting in a deadweight loss to society.

5.1.2 IMPERFECT INFORMATION ON THE BENEFITS OF CONSUMPTION OF A GOOD

Examples are primary education and preventive healthcare of inoculations/immunisations for children and students or vaccinations against the spread of diseases such as Covid-19. Apart from the presence of positive externalities in the consumption of immunisation, consumers also have imperfect information of the true private benefits of immunisation shots. Thus, market failure arises as there will be an underconsumption of immunisation shots.

Let us consider the case of underconsumption of immunisation shots for healthcare due to **imperfect information.**

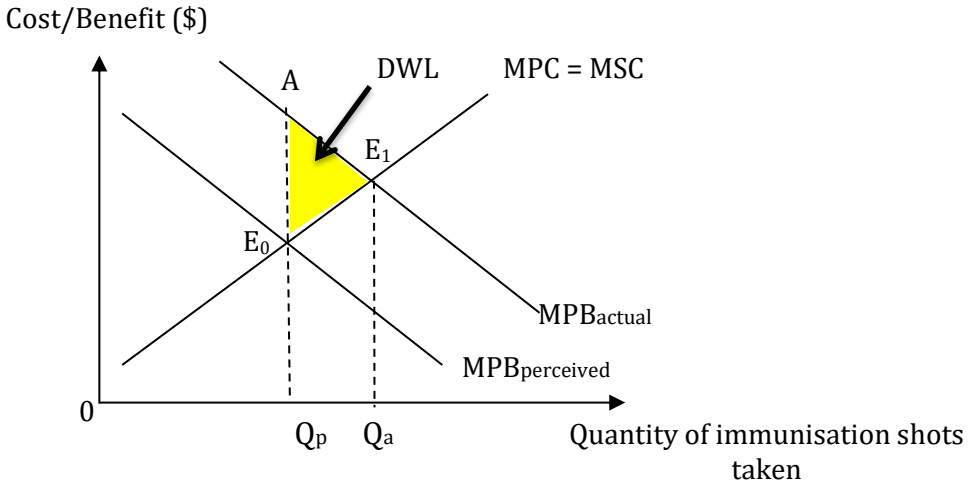


Figure 9: Imperfect information of the actual benefit resulting in allocative inefficiency

Due to imperfect information, goods such as immunisation shots can be underconsumed because consumers are not fully aware of the longer-term health implications of their consumption decisions. Consumers may **undervalue the MPB** (benefits) of receiving immunisation shots such as overall better health and improved productivity at work rather than just a temporary improvement in immunity system, or the perceive that they will never be infected.

As shown in Figure 9, when consumers undervalue the private benefits of receiving immunisation shots, the equilibrium will be at $0Q_p$ where MPC=MPBperceived.

However, if consumers can appreciate the **actual private benefit** of going for immunisation shots, the quantity will be at Q_a where MPC=MPBactual. The gap between Q_a and Q_p represents the under-consumption due to **imperfect information.**

There is welfare loss to the society as the potential gain of area $QpAE_1Qa$ due to increased consumption with perfect information outweighs the additional cost of area QpE_0E_1Qa to the society with the underconsumption of QpQa. The welfare loss due to the underconsumption (of immunisation shots) is represented by area E_1AE_0 in the figure above. This results in **allocative inefficiency** causing a deadweight loss to society.

5.1.3 MICROECONOMIC POLICIES FOR IMPERFECT INFORMATION ON BENEFITS AND COSTS OF CONSUMING A GOOD

Besides efficiency, another reason for a government's decision to intervene in some of the markets which exhibit positive externalities in consumption and which are deemed essential for society is to improve **equity**. When more people have better access to essential goods such as education and healthcare through measures such as government *subsidies* and d*irect provision*, there will be an improvement in terms of equity in the society.

Imperfect information can be caused by lack of or inaccurate information. The government believes that individuals may not act in their own best interests because of imperfect information about the benefits or costs that may result from the consumption of a good.

The following measures can be used to **address the market failure due to the imperfect information** about the benefits or costs that may result from the consumption of certain goods and services.

a) Public education

In using public education, the government reduces imperfect information by providing consumers with information about the "true" marginal private cost/benefit of consuming an extra unit of a good for themselves and encourages them to consume more/less of it, thereby improving their individual decision-making. The government provides information through public education via national campaigns, and/or radio and TV broadcasting and social media platforms.

i) Application of public education to inform consumers the actual cost of a good and to reduce its consumption

In Singapore, The Ministry of Health and the Health Promotion Board aim to help Singaporeans increase their quality and years of healthy life through organising regular health education in schools and conduct community health screening, national campaigns to inform public about the harmful effects of smoking cigarettes.

Cigarette manufacturers are required by law to display health warning messages on all tobacco product packaging and labelling to inform smokers the negative health effects of smoking and hence discourage them from smoking.

With reference to Figure 8, the aim of public education is to increase perceived marginal private cost (MPCperceived) to actual marginal private cost (MPCactual). Consumption of cigarettes is reduced from 0Qp to 0Qa as consumers will now consume at where MPCactual=MPB. Deadweight loss is eliminated, and allocative efficiency is achieved.

ii) Application of public education to inform consumers the actual benefit of a good and to increase its consumption

For example, in Singapore, the Health Promotion Board organises regular health education in schools and conduct national campaigns to inform public about the benefits of health checks and going for immunisation shots before travelling or during viral flu periods. During the COVID-19 pandemic, the government put up advertisements in the newspapers as well as broadcast videos on TV and Youtube to persuade people to be vaccinated and address their concerns regarding the vaccination.

With reference to Figure 9, the aim of public education is to increase perceived marginal private benefit (MPBperceived) to actual marginal private benefit (MPBactual). Consumption will increase from 0Qp to 0Qa as consumers will now consume at where MPBactual= MPC Deadweight loss is eliminated, and allocative efficiency is achieved.

Advantages of using public education

f. Addresses the root cause of imperfect information

Public education directly addresses the root cause of imperfect information by closing the information gap and improving the accuracy of information accessed by the public. This helps to reduce if not eliminate the divergence between the actual and perceived costs and benefits of consuming the goods or services concerned.

g. Less distortion to price signals

It encourages desirable behaviour of consumers who are receptive towards public education without imposing excessive costs on society or causing allocative inefficiency due to distortion of price signals. Public education does not directly affect the prices of the goods and is thus less likely to lead to over-correction of the market failure and misallocation of resources.

LIMITATIONS

While public education can address the information gap, it may not be effective in changing people's motivation or attitudes. For example, even if a person is fully aware of the health risks of smoking cigarettes, he may still continue with his smoking habit as he is willing to bear the risks of contracting the smoking-related illnesses for the satisfaction of smoking cigarettes. The success of achieving its intended consequence is less certain compared to the use of regulation because the effectiveness of public education depends on the consumers' appreciation and receptivity. It is usually difficult to change or influence peoples' mind sets and habits within a short time span.

b) Regulation (Command and control measure)

When the government perceives consumers as poor judges of their own welfare, the government could directly influence their consumption pattern by making consumption of the certain goods compulsory by law and/or making it illegal to sell or consume the certain goods. The government may also impose restrictions on the consumption of the good such as banning smoking in public places in order to reduce its consumption because it is more inconvenient to smoke (higher opportunity cost to smoke). This is backed by fines or other forms of punishments when the law is violated.

Examples

a. Making consumption of certain goods compulsory: Primary education, vaccination against communicable diseases like smallpox.

b. Regulate production of goods: Limit the nicotine and tar levels of cigarettes sold locally.

c. Regulate sale of goods: Age restriction in prohibiting the sales of tobacco products and alcohol consumption by persons under 18 years of age

d. Regulate consumption of goods:

- ❖ Partial bans – prohibit smoking in public places.
- ❖ Total bans on the consumption of recreational drugs and sale of chewing gums in Singapore.

Regulation can also be used to improve the flow of information so that consumers are more aware of the true MPB/MPC of the good and will thus be able to make an informed rational decision.

Example

Compulsory text and pictures in health warning messages to be displayed on all tobacco product packaging and labelling highlighting the negative health effects of smoking.

LIMITATIONS

a. Administrative and enforcement costs

Regulation may involve high administrative and enforcement costs, as the government will need to spend on publicity campaigns to inform the public about the new laws or regulations and hire additional staff to enforce the regulations such as conducing spot checks on premises. There will also be costs incurred in prosecuting offenders and administering the penalties.

b. Over-correction

If the regulations are overly restrictive e.g. a complete ban or making consumption of the good or service compulsory, it could result in over-correction of the market failure and a larger deadweight loss. For example, making vaccination compulsory for all may also result in welfare loss as those who are unsuitable for the vaccine due to allergies or underlying medical conditions may end up worse off if they are compelled to take the vaccination.

5.2 INFORMATION FAILURE - ASYMMETRIC INFORMATION (FOR H2 ONLY)

There are two types of asymmetric information, namely adverse selection and moral hazard.

DEFINITION:

Asymmetric Information is a case where one party in the market – either consumers or producers – has more information about the product than the other resulting in a distortion of incentives and inefficient market outcomes.

NOTE:
Difference between adverse selection and moral hazard

Adverse selection *occurs when there's a lack of symmetric information* ***prior to a deal*** *between a buyer and a seller.*

Moral hazard *occurs when there is asymmetric information between two parties and a change in the behaviour of one party* ***after a deal is struck.***

5.2.1 ADVERSE SELECTION

DEFINITION:

Adverse selection occurs when asymmetric information between buyers and sellers of a product causes one of the parties to make suboptimal choices that result in lower welfare and thus an inefficient market outcome.

The classic cases in which this occurs is in the market for used cars and in the insurance market. The following are examples of how adverse selection occurs.

i. **The Used Car Market**

In the used car market, there is asymmetric information as sellers of the cars will have more information about the condition of the cars than buyers of the car. Sellers will know exactly what is wrong (or good) with their car, but buyers do not have such information. This will lead to adverse selection in the used car market.

To profit from the sale of used cars, dealers might hide some information they have about the condition of used cars from potential buyers. Potential buyers will take this into consideration in their decision making process, and tend to lower the price that they are willing to pay for used cars because they may be purchasing cars of lower quality (often referred to as 'lemons'). At this lower price, sellers with used cars in good condition (often referred to as 'peaches') are unwilling to offer the cars for sales, resulting in a used car market where only lower quality used cars (lemons) are sold. As a result, the proportion of poor quality cars in the used car market will be significantly higher than used cars of good condition. The chances of a potential buyer getting a poor quality used car are higher than a used car of good condition.

Hence, this results in the used car market adversely selecting against higher quality used cars in favour of lower quality ones. This means that buyers often end up buying lower quality or defective cars at a higher price than what they would have been willing to pay if they had perfect information about the car. Their marginal benefit of buying the used car would be lower than the marginal cost of the car, thus resulting in welfare loss and market failure. In the absence of any intervention, the market for used cars can also fail completely because buyers will not want to buy cars from the used car market for fear of purchasing a car that is of poor quality, resulting in quantity of used car sold in the used car market to be 0.

However in reality, the market for used cars still exists due to the various methods that people use to try and curb the problem of adverse selection.

ii. The Insurance Market

In the insurance market, there is asymmetric information, leading to adverse selection. In the case of health insurance, the insurance company will cover the medical costs of a consumer who has purchased health insurance from them.

Consumers of healthcare insurance might not share sufficient and accurate information about their health condition to insurance companies. For example, a person who buys a health insurance may not disclose that he has a heart condition that could lead to serious medical complications,

resulting in asymmetric information between consumers and insurance companies. Consumers with higher risks are more likely to buy health insurance and opt for higher levels of coverage since they know they are at greater risk of falling ill. As the proportion of unhealthy people in the pool of insured people increases, this will result in significant increase in the number of medical claims to insurance companies.

If the insurance companies had perfect information of their health conditions, the insurance companies would have charged these unhealthy people a higher premium (i.e., insurance fees) to account for the possibility of an increase in number of medical claims from them. Hence, insurance companies will then raise their premiums to cover their losses, which forces the price of insurance to increase. As a result, more healthy people who are aware of their low risks choose not to be insured because the rising premiums could exceed their marginal benefit of purchasing insurance. This will further increase the proportion of unhealthy people among the insured, which forces the price of insurance to increase further. This process will continue until nearly all the people who want to buy insurance are unhealthy to a certain extent.

Therefore, the health insurance market can fail completely because insurance companies will not want to sell health insurance to unhealthy people as that can become unprofitable. As such, theoretically, there will be "missing market" and potential total market failure. Even though health insurance can be beneficial to society, there will be no provision of such goods in society.

However, in reality, the complete collapse of the market is not observed because of various measures implemented.

Solutions to overcoming adverse selection

a) Investing in information

In a case where buyers are uninformed, they can invest in information that is provided by independent parties. For example, in the case above, the buyer can read up on the general information on different models and brands of cars. The buyer can also make use of the internet to find out the prices that certain used car models are selling for to have a general gauge on how much they should be

paying. The most convenient way is perhaps getting a mechanic to inspect the car before purchasing it.

The action of investing in information enables buyers to make a better decision in their purchases. Also see example of Health Products Bill in *d) Laws*.

b) Signals

Signals are an action taken by an informed party to reveal private information to an un-informed party. In the case above, the seller of the used car could provide a signal that the used car is in an excellent condition. The seller can do so by offering a warranty which guarantees that for the next six months the seller will fix any defects in the car. This warranty acts, as a signal that this car is in good condition otherwise the seller would not dare to provide such a costly warranty. Also see example of registration of private schools in *d) Screening*.

c) Screening

Screening is an action taken by an uninformed party to induce an informed party to reveal information. For example, in the above example, the buyer can ask for a mechanic to check the car before purchase. Another example would be in the case of purchasing insurance. Insurance companies often ask customers to undergo a medical examination before agreeing to insure the individual. These actions force the informed party to provide the information needed by the uninformed party to make better decisions.

Private schools are required to register with the Ministry of Education. Although MOE does not screen the quality of these schools, it approves the registration based on some basic statutory requirements, such as building and fire safety requirements, acceptable curriculum, and qualified teachers. Such registrations also function as signal for the consumers to inform them that these schools meet the basic statutory requirements.

d) Laws

In Singapore, the Consumer Protection (Fair Trading) Act (CPFTA) includes a provision for a 'lemon law'. This law allows for the replacement or repair of a product whose defect surfaces within 6 months of purchase, failing which, a price reduction or a full refund would be required. The law prevents retailers from selling defective products, protecting the consumers.

Another way of protecting consumers is by establishing industry standards that the product must meet a certain requirement before they are put up for sale. This prevents the dumping of defective products to retailers by manufacturers.

Vendors can also be required to disclose information about the product for sale such as the nutritional value on the labels on food. In Singapore, in early 2007, Singapore's Health Minister introduced the Health Products Bill in Parliament. The objective of this Bill was to protect the public and it is proposed that all health products including medical devices, pharmaceuticals, health supplements and traditional herbal medicine be evaluated and entered into a central registry, under categories determined by the Health Sciences Authority. This would help the public have more information about what they are purchasing and not buy products that could harm them.

5.2.2 MORAL HAZARD

DEFINITION:

Moral Hazard is the situation in which economic agents take greater risks than they normally would because the resulting costs will not be borne by them, but instead the cost is shifted onto the other party.

From the definition, we can see that moral hazard arises when one party has the incentive to take on risky activities knowing that the other party will incur the cost. This happens because of asymmetric information, whereby the party incurring the cost does not know the intention of the other party to engage in risky activities. A common occurrence of moral hazard is after the signing of insurance contracts.

An example would be when a shop owner who does not take the due care in order to prevent a fire from occurring because he knows that his insurance will cover the costs should a fire break out. As a result, the shop owner will have less incentive to take care of his shop in order to prevent fire from breaking out. This can result in more insurance claims and thus impose a higher costs on the insurance companies. This may result in the insurance company having to charge a higher premium to all shop owners in order to cover the costs that the insurance company faces.

This is a form of market failure as the marginal cost might exceed the marginal benefit for shop owners who take proper precautions. Likewise, people who have bought medical insurance may more likely seek medical treatment after they have fallen ill, even for minor ailments (which they previously would not have sought medical treatment for) because they know that their medical costs will be paid by the insurance company.

Solutions to overcoming moral hazard

a) Incentives

One way in which insurance companies can reduce the problem of moral hazard is to offer incentives such as lower premiums or discounts for those with good track record. Insurance companies charge lower premiums for those who show that they take proper precautions against risks such as the installation of smoke detectors or fire extinguishers. Motor vehicles insurers offer a No-Claim Discount (NCD) on the premiums of buyers who have not made any accident claims on their vehicles.

b) Deductibles and co-payment

Another possible solution is to make use of deductibles. Deductibles are the initial amount of money that the insured party needs to pay before the insurance company pays for the rest. In the case above, if the shop owner knows that he/she will have to pay for the loss should a fire break out, they may take more precautions to prevent a fire from happening.

Another solution adopted by insurance companies is co-payment, whereby the insured party has to pay part of the cost should a claim be made i.e. the insurance company only covers a portion of the amount to be claimed. For example, in the case of medical insurance, the insurance company may only cover 80% of the medical bill, while the insured party has to pay the remaining 20% of the costs. Such deductibles and co-payment schemes make the insured party bear part of the cost should a claim be made, thus disincentivising the risky behaviour and reducing the moral hazard.

6. MARKET DOMINANCE (FOR H2 ONLY)

Learning Objectives:

- ✳ Explain how market structure characteristics influence the level of market dominance.
- ✳ Analyse why market dominance can lead to allocative inefficiency.

In the absence of externalities, one of the underlying assumptions involved in ensuring that the free play of market forces would lead to optimum efficiency in resource allocation is the existence of perfect competition in both the factor and product markets. Unfortunately, perfect competition does not always exist in reality. In Chapter 2, we learnt that free market forces are able to allocate resources efficiently to determine the market price and output. However, in Chapter 4, will find out that firms with market power possess price setting ability which will lead to inefficiency.

SOLUTIONS (refer to Chapter 4B)

- Anti-trust policies
- Regulation through lump-sum taxes (mainly to correct inequality of income)
- Nationalisation (does not necessarily reduce inefficiencies due to "crowding out" of private initiative)
- Regulation through using pricing policies

7. FACTOR IMMOBILITY

Learning Objectives:

- ✳ Explain why occupation and geographical immobility can lead to inefficiency.
- ✳ Analyse and evaluate (in relation to efficiency and/or equity) how subsidies and provision of training impact the achievement of socially optimal consumption / production level.

DEFINITION:

Factor immobility refers to the inability of a factor of production to shift from one use or area to another, even in response to large changes in demand and remuneration.

7.1 OCCUPATIONAL IMMOBILITY

This occurs when there are barriers to the mobility of factors of production between different industries and occupations. Some capital inputs are occupationally mobile. For example, a computer can be put to productive use in many different industries. Commercial buildings can be altered to provide a base for many businesses. However some capital units are specific to the industry they have been designed for. For example, nuclear power stations will have little use other than be used to produce nuclear power due to the radioactive waste and complex equipment that is present in the power plant. This makes the conversion of the nuclear plant for alternative use extremely difficult if not impossible.

Labour as a factor of production often experiences occupational immobility, which can lead to people remaining unemployed, or being used in ways that are not economically efficient (also known as underemployment). For example, workers retrenched from the declining textile industry may have job-specific skills that are not necessarily transferrable to expanding industries such as aerospace, and may not easily have been able to acquire skills needed for such a transfer. This type of unemployment is known as structural unemployment. There is a mismatch of skills between the retrenched textile workers and those required by employers looking to hire additional workers. Without retraining or upgrading of skills, labour remains structurally unemployed due to workers possessing the wrong skills thereby resulting in inefficiency.

7.2. GEOGRAPHICAL IMMOBILITY

This refers to the lack of preparedness of people to move between and within countries in response to changes in the labour market either due to social (e.g. family ties) or financial factors (e.g. high cost of relocation, significantly different cost of housing in different parts of the country or differences in the general cost of living between regions/location). Labour therefore remains regionally unemployed, even when there is a demand for it in another area.

WHY IS FACTOR IMMOBILITY A FORM OF MARKET FAILURE?

Economic systems have to respond to a rapidly changing economic environment by reallocating resources. Factor immobility prevents the switch to the production of new goods and services most valued by society, in the quantity required, thereby resulting in allocative inefficiency while the underemployment or unemployment of immobile factors results in productive inefficiency. This means that the economy is not producing the maximum output that is possible with its given resources, and hence welfare is not maximised. Since allocative efficiency is represented by a point on the PPC where social welfare is maximised, it

MAKING CONNECTIONS:

Factor Immobility and the PPC

Due to factor immobility, factors of production may be underemployed or unemployed. As a result, the economy would be producing within the PPC (point A) instead of on the PPC (point B). The economy would thus be considered productively inefficient. Society could actually be made better off by employing or better utilising these factors of production to produce more of both goods and thus achieve productive efficiency.

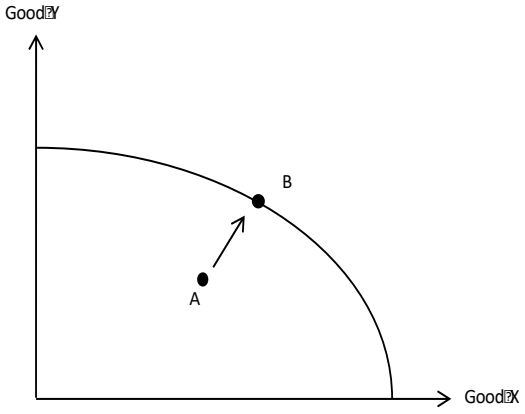


Figure 10: Production Possibilities Curve

means that there must be productive efficiency (producing on the PPC) in the first place. This means that where productive inefficiency exists (ie the economy is producing at a point inside the PPC), allocative efficiency cannot be achieved, hence resulting in market failure.

NOTE:
Supply side policies to alleviate factor immobility will be discussed in SH2.

c. Solutions to overcoming factor immobility

a) Improving the information flow

Provide information on jobs to those looking for work and put firms in touch with possible suitable labour.

b) Training of workers through skills upgrading programmes

Equip workers with the necessary skills to be re-employed in the production of other goods and services.

c) Improving infrastructure or transport system

This may reduce travelling time between areas or enhance living conditions to make relocation easier, thus addressing geographical immobility.

d) Providing incentives

Provide incentives for workers to upgrade themselves or to relocate to another area.

Note: Policies to address unemployment due to labour immobility will be discussed in more detail under Macroeconomics.

8. COGNITIVE BIASES AND GOVERNMENT INTERVENTION

Learning Objectives:

- ✳ Explain and illustrate with examples how cognitive biases can impact the effectiveness of government policies.
- ✳ Explain and illustrate with examples how the government can make use of cognitive biases to enhance the effectiveness of its policies.

In traditional economics, economic agents are assumed to be rational and thus make decisions that would maximise their self-interest. This has been the premise for many of the market-based policies adopted by governments to influence the decisions of consumers and producers by manipulating the benefits and costs through the use of subsidies and taxes or other financial incentives and penalties. However, in reality economic agents do not always behave rationally and may be influenced by cognitive biases which affect their decision making. Due to such cognitive biases, the effectiveness of the microeconomic policies or government intervention may be undermined as the economic agents may not behave according to what is expected based on traditional economic theory. On the other hand, government may be able to make use of the cognitive biases to craft policies that are in place of other conventional policies like taxes and subsidies.

In Chapter 4, we will look at how firms can adopt strategies that leverage cognitive biases to influence consumers' choice, thus increasing their revenue and profits. Likewise, governments can apply their knowledge of cognitive biases to enhance the effectiveness of their policies. Behavioural economists have suggested that governments can design or frame their policies in such a way that will nudge people towards the desired behaviours or away from the undesirable behaviours, The way choices are framed or designed such that it influences people's behaviour or decisions is known as a "nudge". In this section, we will look at how cognitive biases can impact the effectiveness of government policies or be used to enhance their effectiveness.

a. Sunk cost fallacy

Sunk cost fallacy arises when a person's decision is affected by fixed cost that cannot be recouped rather than marginal cost. This cognitive bias can be useful and the government can consider applying sunk cost fallacy in its policies to nudge people into certain behaviours or making certain choices. For example, they can make use of membership schemes to encourage people to engage in certain desired behaviours. Once a person has paid the fees to become a member, he may be more inclined to make full use of the membership to participate in the activities or make use of the services associated with the scheme. This can be applied to public services that are considered desirable for people to use e.g. public libraries, museums or sports facilities. The government can also offer special packages e.g. family packages to encourage people to visit places that the government wants to promote due to their social or educational value e.g. family package for the Singapore Zoo and Flower Dome at Gardens by the Bay. The payment of a larger sum upfront is seen as a sunk cost and encourages people to visit the place more often.

Knowledge of the sunk cost fallacy also allows us to evaluate government's mircoeconomic policy. One example is the Certificate of Entitlement (COE) scheme in Singapore, where the sunk cost fallacy may render such a policy less effective. The COE scheme aims to reduce traffic congestion by controlling the car population. The COE scheme is essentially a quota system in which car buyers need to bid for a COE in order to purchase a new car. The number of COEs issued is set by the government and hence effectively controls the number of cars that can be bought. The price of the COEs is thus determined by the market forces of demand and supply, with the supply being fixed by the government. Due to the limited COEs available as the government seeks to control the car population, COE prices tend to rise sharply with rising demand for cars and can often cost more than the price of the car itself. Due to the high price of buying a car, car owners may be affected by the sunk cost fallacy in their decisions to make use of the car. A car owner may reason that since he has paid such a high price for the car and the COE is only valid for ten years, he should use the car as much as possible over the ten-year period. This causes him to use the car more often than necessary. When most if not all car owners have the same mentality, there will continue to be a high volume of cars on the road, and traffic congestion

is not reduced significantly, making the scheme less successful. Moreover, the car owner's mentality of wanting to use the car as much as possible reduces the PED for car usage, making his demand for car usage more price-inelastic. This means that the car owner will be less responsive to changes in ERP charges and petrol prices, as he will want to maximise the use of his car despite the increase in the costs of using the car. Hence this makes the ERP scheme less effective as well.

b. Loss aversion

Loss aversion refers to the tendency for people to choose the avoidance of a loss over an equivalent gain. It stems from the premise that the negative psychological impact of a loss on an individual is greater than the positive psychological impact of a gain of an equivalent amount. In other words, the pain felt by a person from a given loss is greater than the pleasure felt from an equivalent gain. This causes people to choose an option that would avoid a loss, rather than one which offers a gain of the same amount. Loss aversion may not necessarily be in monetary terms, but can also apply to losses in terms of time, resources or possessions.

The government can apply loss aversion in their policies to make them more effective. For example, to discourage people from using plastic bags, it would be more effective to impose a charge for the use of plastic bags rather than give a discount or subsidy for not using plastic bags. Likewise, a subsidy for the use of public transport or purchase of electric vehicles may not be as effective unless it is accompanied by higher taxes on the use of petrol-powered cars. People may be more willing to switch to electric cars or public transport if they feel the pain or loss from using petrol cars, rather than being induced by subsidies or gains from using alternative modes of transport.

Loss aversion can also affect the effectiveness of a government policy if the desired behaviour that the government wishes to promote involves losses or sacrifices which people may be unwilling to forgo despite the possible gains from choosing the desired action. For example, despite subsidies given by the government for skills training and the potential gains in terms of employability and higher future income, many people are still unwilling to attend courses to upgrade their skills. This could be due to their unwillingness to bear the losses in terms of time and earnings

forgone (depending on the type of jobs) if they choose to go for skills training. It may be noteworthy that by end of 2020, four years after the implementation of the SkillsFuture Credit scheme, only about 25% of the eligible Singaporeans have made use of their SkillFuture credits to attend training courses.

c. Salience bias

Salience bias refers to the tendency for people to focus on information that is more prominent and over other less prominent but equally relevant pieces of information. In other words, people tend to make choices or judgements based on information that is more prominent or noticeable, or what is more salient in their minds, rather than fully and objectively weighing all the relevant costs and benefits. Salience bias may hinder the effectiveness of government policies or campaigns if people are influenced by other sources of information that are more prominent or salient in their minds. For example, despite the government's caution regarding the risks on investing in cryptocurrency, many people still choose to invest in cryptocurrencies such as Bitcoin as they have been constantly exposed to the online advertisements about people making huge gains from investing in cryptocurrencies. On the other hand, after a major air crash involving a national airline, people may be afraid to travel on the national airline despite the government offering incentives, as news of the air crash is salient in their minds.

The government can make use of the salience bias to enhance the effectiveness of public education or campaigns. For example, governments can come up with strategies to address market failure with the knowledge of salience bias. For example, to make the ill-effects of smoking salient, governments require cigarette producers to print gruesome pictures of the ill-effects of smoking very visibly on the cigarette boxes. To encourage saving water, utilities bills use easily understood graphs to show the household's water usage as compared to others. This aims to achieve the effect of making the usage of water by the household (especially those who uses a lot) more salient.

9. GOVERNMENT FAILURE

Learning Objectives:

- ✳ Recognise that government intervention does not necessarily lead to more efficient outcomes.
- ✳ Analyse how government intervention results in greater market inefficiencies than would otherwise occur.

Government intervention in the market can itself lead to unintended consequences. The case for non-intervention (laissez-faire) or very limited intervention is not that the market is the perfect means of achieving given social goals, but rather that the problems created by intervention could be greater than the problems overcome by that intervention.

Some of the factors that contribute to inefficiencies due to government intervention are:

a. Imperfect information

The government may not know the full costs and benefits of its policies. It may genuinely wish to pursue the interests of consumers or any other group, and yet may be unaware of people's wishes or misinterpret their behaviour. In the case of negative externalities, the difficulty in establishing a monetary value to the external cost limits the effectiveness of government intervention. For example, it is difficult for the government to determine the right amount of tax to impose on petrol and private cars. Too high a tax may result in significant welfare loss as people who need to drive are not able to afford the higher prices, while too low a tax could result in too many cars on the road, leading to traffic congestion. It is also difficult to measure the costs of traffic congestion and determine what the acceptable level of congestion is.

a. Bureaucracy, Time Lags and Inefficiency

Government intervention involves administrative costs. The more wide-reaching and detailed the intervention, the greater the number of people, material resources and processes that will be involved. These resources may be used wastefully. As government agencies are not subject to the market disciplines of minimising costs and maximising profits, there could be a lack of cost control, giving rise to wastage of resources and greater

productive inefficiency. Government organisations tend to be bureaucratic, with elaborate and rigorous procedures to follow and long decision-making processes before any decisions or actions can be taken. This results in time lags in responding to market changes and greater inefficiency.

b. Lack of Market Incentives

If government intervention removes market forces or cushions their effect (by the use of subsidies, welfare provisions, guaranteed prices or wages, etc.), it may remove certain incentives. Subsidies may allow inefficient firms to survive. Welfare payments may erode or discourage the incentive to work. The market may be imperfect, but it does tend to encourage efficiency by allowing the efficient to receive greater rewards. In the case of nationalised industries, the absence of profit motives and lack of market discipline on the part of the government could result in greater inefficiency in the running of the industry. For example, the government may over-spend on unnecessary items or hire too many staff resulting in wastage of resources and higher costs.

c. Shifts in Government Policy Creating Uncertainties in the Market

The economic efficiency of industry may suffer if government intervention changes too frequently. It makes it difficult for firms to plan if they cannot predict tax rates, subsidies, price and wage controls, etc.

d. Myopic Decision-making

Some governments have the tendency to consider short-term solutions to correct market failure instead of well-considered long-term solutions. These short-term solutions may provide temporary relief to a particular problem but may not address structural problems. For example, continual provision of subsidies to encourage the consumption of healthcare may sometimes prove to be a waste of resources if the underlying causes of healthcare problem are not resolved.

e. Pursuit of Self-Interest

Some politicians may implement policies for their self-interests instead of the benefits of citizens, leading to misallocation of resources. This is especially evident when the government makes unnecessary or excessive spending and reduce taxation to boost state welfare in the run up to an election.

10. DECISION MAKING EXAMPLE

Plans for a $15 million nursing home have been aborted after it failed to secure government subsidies. The building of Jade Circle, a four-storey building next to the Salvation Army's Peacehaven home in Changi, was supposed to start this year. The project, which was developed jointly by Peacehaven, the Lien Foundation and Khoo Chwee Neo Foundation, hoped to pioneer a different model of care for dementia patients by doing away with the usual six- to eight-bed hospital ward layout, and instead provide single or twin rooms with toilets.

The foundations had intended to commit $10 million to the project and the home was meant for both full-paying and subsidised patients who are mobile, with moderate to severe dementia. Fees before subsidies were estimated at $2,800 to $3,500 a month. The Ministry of Health (MOH) told Peacehaven last month that it could not provide subsidies to residents staying in such rooms. In response to queries, the MOH said: "As a matter of policy, it will be difficult for MOH to provide ongoing subsidies for patients staying in wards that are designed to proxy private or A-class ward configurations such as single or double-bedded rooms only. Such parameters will be hard to be financially sustainable, if applied to the rest of the aged care sector."

Peacehaven executive director Low Mui Lang said residents improved after some wards were converted to single and double rooms in Peacehaven in 2006. "They began taking pride in dressing up and initiating their own activities instead of being passive. Dementia patients also tend to get disoriented in a room with so many identical beds, or fight with their roommates due to the lack of personal space." Research has shown that there are benefits to staying in private rooms, such as fewer infections and less hospitalisation.

Source: The Straits Times, 21 Dec 2015 (Adapted)

1. Key Concepts

- ✳ Positive Externalities in Consumption
- ✳ Imperfect information about the true benefit of consumption
- ✳ Microeconomic policy: Subsidies
- ✳ Fiscal sustainability

2. Decision to be made (by government)

✳ Should the government subsidise the $15 million nursing home for dementia patients in view of other competing needs to improve the welfare of the society?

3. Perspectives on the Decision/Issue

✳ Government should consider how the nursing home can improve allocative efficiency by correcting market failure due to the existence of positive externalities in consumption and imperfect information about the true benefit of consumption.

✳ Government should consider the people of different income levels and how the nursing home can lead to improvement in equity.

✳ Government needs to consider the costs and funding given to other similar nursing homes to ensure the subsidy for this nursing home is comparable and equitable.

✳ Government should consider the financial sustainability of the subsidies.

4. Relevant information to support decision-making

✳ Cost of subsidising the nursing home patients

✳ Benefits of having a specialised nursing home (Jade Circle) for dementia patients

✳ Marginal external benefit (fewer infections, less hospitalisation)

✳ Affordability of nursing home to the lower income group

✳ Sustainability of the subsidy in the long term

5. Constraints

✳ Government budget

✳ Manpower and land scarcity

6. Benefits and Costs (Government's perspective)

✳ Benefits of subsidising: more elderly with dementia can receive specialised care, which increases the consumption level to be closer to the social optimal level and enjoy better quality of life (less disoriented and less conflicts with other residents).

✳ Cost of subsidising

✳ Opportunity cost: the value of the next best alternative forgone, e.g. have less funds available for other healthcare services

7. Decision made

✳ The Ministry Of Health decided not to subsidise the nursing home as the cost outweighs the benefits. (The subsidy is seen as less efficient as it would benefit only a relatively small group of elderly patients who can afford to stay in single or two-bed rooms)

8. Intended Consequences

✳ To use the budget for other purposes that benefits the society.

✳ To prevent the need for borrowing or increasing taxes in order to fund the subsidies.

9. Unintended Consequences

✳ Elderly with dementia might not have the avenue to receive specialised care, especially those from the lower-income group.

✳ Producers (other foundations) might be discouraged from planning to build similar specialised nursing homes.

10. Review of the decision made

The government may review its decision on future plans for similar specialised nursing homes after taking into account ***changes*** *over time (such as a surge in dementia patients/ patients with other illnesses that require specialised care, greater discovery of how such specialised care can benefit patients and better economic outlook) and the* ***unintended consequences*** *of not subsidising the patients.*

11. Impact on others

The decision made by the government **affects others – households** with dementia patients may turn to alternative care which may not be as specialised or choose to not send their family members to nursing homes but employ foreign domestic helpers to care for them instead. This may lead to shortage of foreign domestic workers and hence increase in the cost of employing domestic helpers, which will affect all households that need to employ foreign domestic helpers. These may lead to more hospitalisation due to neglect and as such, greater need and a shortage of hospital beds. **Firms,** such as private nursing homes and nursing homes abroad may also be affected by increased demand to send the elderly with dementia to such establishments.