RAFFLES INSTITUTION YEAR 5 H1 ECONOMICS

MARKET FAILURE AND GOVERNMENT INTERVENTION

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References

- 1 Dornbusch, Begg & Fischer. Economics. 7th Edition. Chapter 15.
- 2 Sloman, J. Economics. 6th Edition, Hertfordshire: Prentice Hall. Chapter 10 & 11.
- 3 Gwartney, Stroup & Sobel. <u>Economics:</u> Private and Public Choice. 9th Edition. Dryden. Chapter 5
- 4 Lipsey, Courant, Purvis & Steiner. <u>Economics.</u> 10th Edition. HarperCollins. Chapter 20.
- 5 Economics in Public Policies, The Singapore Story, Tan Say Tin *et al*. Marshall Cavendish, Chapter 3, 6 & 7

Lecture Objectives

At the end of this series of lectures, students should be able to:

- explain what is meant by allocative efficiency
- explain the meaning of market failure
- explain the causes of market failure:
 - explain externalities as a source of market failure
 - \circ $\,$ explain the concepts of merit and demerit goods and why they result in market failure
 - explain why public goods are not provided by the free market with respect to the characteristics of these goods.
 - o explain how imperfect information can lead to market failure
- evaluate policies to correct the various sources of market failure

A. MARKET FAILURE

1 INTRODUCTION

Markets do many things well, but they do not do everything well. Most people's practical and moral sense argue for some degree of state intervention to mitigate areas in which markets do not function well and in which state intervention can improve the general social welfare. In this series of lectures, we identify and explain the microeconomic problems that call for and justify the need for government intervention.

Microeconomic problems generally fall into two broad categories: (i) allocative inefficiency and productive inefficiency that arise as a result of market failure and (ii) income inequality that arises as a result of letting the market determine the prices of resources and goods. From the point of view of society's sense of justice and fairness, the free market distribution is inefficient. To correct market failure and reduce income inequality, various government policies may be adopted to improve the market's allocation of resources. However, it is important to be aware that sometimes, **government failure** may also result.

2 EFFICIENCY AND EQUITY IN RELATION TO MARKETS

Markets are a good way to organise economic activity. However while markets do many things well, they do not do **everything** well. In practice, markets sometimes fail to allocate resources efficiently or to achieve social goals like income equity.

Market failure is defined as the failure of the free market to achieve allocative efficiency, resulting in over-allocation / under-allocation of resources relative to the socially efficient level or to achieve social goals such as income inequality.

This section of the notes explores in greater depth the shortcomings of the price system as an allocative mechanism and the economic rationale for government intervention in a market economy.

Efficient allocation of resources includes allocative efficiency and productive efficiency.

Allocative Efficiency: Allocative efficiency is the situation in which the society produces and consumes a combination of goods and services that maximises its welfare. It is achieved when goods and services wanted by the economy are produced in the right quantities.

Allocative efficiency is achieved when

- Price equals marginal cost of production (P=MC), where society's valuation of the last unit of good consumed is equal to the opportunity cost in producing that last unit of output
- Marginal Social Benefits equals Marginal Social Costs (MSB=MSC), where the additional cost to society of the last unit of output produced/consumed is equal to the additional benefits to society of the last unit of output produced/consumed.

Productive Efficiency: how to produce

Productive efficiency is achieved when all resources are fully and efficiently utilised and the cost of producing any given level of output is minimised.

From a macro-economic perspective: Productive efficiency is achieved when society produces at any point on the Production Possibility Curve (PPC). Productive efficiency is achieved when resources are used to maximum capacity. That means they are fully employed i.e. there is neither unemployment nor under-employment of resources. In this regard, all points on the Production Possibility Curve are productively efficient.

Dynamic efficiency

This occurs in a market <u>over a period of time</u> when changes are occurring at the best rate in the economy. It focuses on changes in the amount of consumer choice available in the markets together with the quality of goods and services available. For example: Is new technology being developed and adopted at the best rate? Are firms reducing costs over time?

Dynamic efficiency can be boosted by Research & Development (R&D) spending that leads to improvements in products and the production process; investment in the human capital of the workforce leading to gains in productivity and in product quality which is vital in high value high-knowledge sectors; greater competitive pressures in markets and the transfer of knowledge and ideas across countries.

Equitable distribution of goods: For whom to produce

It is important to note that efficient resource allocation may not result in an equitable outcome as expected by society. Equity can be defined as fairness in the distribution of economic welfare. Society's sense of fairness and justice in the distribution and access to essential goods and services, such as education and healthcare services involves value judgement.

2.1 HOW THE FREE MARKET MAY LEAD TO EFFICIENT ALLOCATION OF RESOURCES (Recap of previous set of lecture notes)

Allocative Efficiency

(1) Demand and supply framework:

The free market economy allocates scarce resources according to the forces of **market** demand and market supply. Assuming perfect competition (i.e. a competitive market) and the absence of other sources of market failure, the equilibrium quantity where supply equals demand typically represents allocatively efficient level of output. The right amount of resources is allocated to the production and consumption of the good from society's point of view. To use Adam Smith's famous metaphor, the "invisible hand" of the marketplace leads buyers and sellers in a market, each pursuing only self-interest to maximise the net benefit that society derives from that market.



Figure 1 shows the market for corn. The demand and supply curves contain important information about benefits and costs. The demand curve for corn (DD) reflects the value of corn to consumers, as measured by the prices consumers are willing and able to pay. At any quantity, the demand curve shows the willingness and ability to pay of the marginal consumer. That is, it reflects the consumer's additional utility or marginal benefit (MB) derived from purchasing the last unit of corn. In the pursuit of self-interest, utility-maximising consumers will only consider their marginal private benefits of consumption and the price Po they actually pay. Consumers will consume that unit of the good so long as the MPB from consumption exceeds the price Po that

they actually have to pay. Consumers will consume up to the point when the MPB from consumption equals the price that they actually have to pay $0P_{\circ}$ at $0Q_{\circ}$. At this output, consumer welfare (also known as consumer surplus) of area $P_{\circ}AE$ is maximised.

Similarly, the supply curve (SS) reflects the marginal costs (MC) of producing the additional unit of corn. In other words, it shows the opportunity cost in terms of resources used in producing the last unit of corn. In the pursuit of self-interest, the profit-maximising producers will only consider the marginal private costs of production and the price OP_0 that they actually receive and retain. Producers will produce that unit of the good so long as the MPC from production exceeds the price Po that they actually receive/retain. Producers will produce up to the point when the MPC from production equals the price that they actually receive/retain OP_0 at OQ_0 . Producer welfare (also known as producer surplus) of area P_0EB is maximised at OQ_0 .

In the absence of other sources of market failure, allocative efficiency is achieved when price (0Po) equals marginal cost (MC) of production. Society will want to produce and consume those units whereby the price exceeds the MC of production up to the level of 0Qo where 0Po equals MC of production.

In the absence of government intervention, the price (0P) will adjust to balance the supply and demand for corn. [Recall how shortages and surpluses are automatically eliminated via the price adjustment process.]

At the market-clearing equilibrium, the marginal benefit of consuming the last unit of corn as reflected by the price (MB=P) that consumers are willing and able to pay equals the marginal cost incurred in producing that last unit of corn (MC). When demand curve intersects supply curve,

P = MC

In other words, allocative efficiency is achieved when the value society places on the last unit of the good (P) is equal to the opportunity cost in terms of resources used in producing that last unit (MC). It is a situation when goods and services that are wanted by the economy are produced in the right quantities.

(2) Marginal Social Benefit/Marginal Social Cost Framework (MSB/MSC):

Marginal Social Benefit Equals Marginal Social Cost at the allocatively efficient level of production and consumption

Assuming that in the corn industry, consumers' marginal private benefit (MPB) represents society's marginal social benefit (MSB) of consuming corn and producers' marginal cost (MPC) represents society's marginal cost (MSC) of producing corn, then allocative efficiency is achieved when:



2.2 MARKET FAILURE: WHY FREE MARKETS MAY NOT LEAD TO ALLOCATIVE EFFICIENCY AND EQUITY

Market failure is defined as the failure of the unregulated market system to allocate resources in an optimum and efficient manner and/or to achieve social goals like equity.

Markets may not operate ideally and may fail in terms of the non-provision of public goods and services, or non-socially optimal levels of production and consumption, is expected. When markets fail, the society suffers from a deadweight loss: a reduction in net benefit to society when the level of output is not socially efficient. Governments may decide to intervene when market outcomes are deemed undesirable, for either efficiency or equity reasons.

2.2.1 EXTERNALITIES (Third-party effects ignored due to the pursuit of selfinterest)

An externality occurs when some of the costs of benefits associated with the production or consumption of a good 'spills over' onto third parties, that is, to parties other than the immediate buyer and seller. The private decision-maker does not take into account these external costs and/or benefits.

Externalities thus create a **divergence** between private and social costs and benefits. In their pursuit of self-interest, producers and consumers will only consider their own private costs and benefits. Private decision makers will not take into account third party costs or benefits.

TERMINOLOGY

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

External cost: costs that are imposed on third parties who are not directly involved in the production or consumption of good or service.

Social cost: the opportunity cost to society, i.e. to all individuals in the society; measures the value of the next best alternative use of resources available to the whole society; consists of both private and external costs.

Social Cost = Private Cost + External Cost

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

External benefit: benefits that are enjoyed by third parties who are not directly involved in the production or consumption of good or service.

Social benefit: refers to the total gains in welfare by the whole of society from the consumption or production of a certain good/service by a private individual or firm; includes the gains to the private consumer or producer and external benefits.

Examples of externalities include the following:

Negative externality in production – occurs when costs are imposed on third parties from the production of good or service by firms.
 e.g. chemical firms dumping waste into the river or polluting the air and motorists producing car journeys

Chemical firms incur <u>private costs in their production</u> like electricity costs, raw material and labour costs. As a result of lack of environmental controls, when they dump waste in a river or pollute the air, the community bears costs additional to those borne by the firms (or <u>external costs</u>). It affects the production of fishermen (fewer fish, harder to catch fish, hence affecting their livelihood). However, the affected third parties are not compensated by the chemical firms for the ill effects imposed on them.

ii. <u>Negative externality in consumption</u> – occurs when costs are imposed on third parties from the consumption of good or service by private individuals.

e.g. consumption of cigarettes

The consumption of some products can generate negative consumption externalities. For instance, the consumption of cigarettes in a restaurant while providing the person consuming them private benefits (satisfaction from smoking – e.g. relieve stress, looks cool), may cause other diners to enjoy their meal less. In addition, people around these smokers may experience health problems (e.g. triggering a sinus attack) due to breathing in the second-hand cigarette smoke and seek medical treatment which incurs costs. However, these non-smokers are not compensated by the smokers for the ill effects imposed on them.

iii. <u>Positive externality in production</u> – occurs when benefits are enjoyed by third parties from the production of a good or service by private firms.

e.g. research and development

When one firm engages in research and development, its <u>private benefits</u> include the potentially higher profits that can be earned. If other firms also have access to the results of the research, then the benefits of the research extend beyond the firm that finances it. These <u>external benefits</u> include the higher profits that other firms not involved in the R&D may also reap. Economic growth may also be higher as a result of increased productivity due to the widespread adoption of the new technology. However, the firm that engages in R&D is not compensated by the third parties for generating these external benefits.

iv. <u>Positive externality in consumption</u> – occurs when benefits are enjoyed by third parties from the consumption of good or service by private individuals.

e.g. education and healthcare

Education is especially important to a knowledge-based economy like Singapore. Education brings about economic and social benefits to society, over and above the private benefits that the individual receives from his education. To the individual, the <u>private benefits</u> of education include an improvement in his productivity and earnings. This allows for his upward social mobility which can possibly bridge the income inequality gap.

Education provides a number of <u>external benefits</u> that might not be taken into account by the free market. The external benefits include higher economic growth. This is because education enhances a country's economic competitiveness as it improves the quality of the labour force. This in turn attracts foreign investors into the country, thus resulting in higher economic growth and a reduction in unemployment. Social, political instability and crime rate may also fall.

2.2.1.1 NEGATIVE EXTERNALITY

An example of a good that generates <u>negative externalities in production</u> is in the production of chemicals. Assume that chemical factories pollute rivers and that the level of pollution rises with output. Downstream companies may be using river water as an input and fishermen rely on the river for fish. However, the chemical factories in the pursuit of self-interest only consider their <u>own private costs (e.g. electricity, manpower costs) and the (free market) price they receive for their product and ignore the external costs imposed on the fishermen and downstream companies As such, these external costs create a divergence between the marginal private cost (MPC) and marginal social cost (MSC) of producing the chemicals.</u>

MSC = MPC + MEC

When MEC > 0, then MSC > MPC

Figure 2 shows the market demand and market supply curves for chemicals. The supply curve for chemicals reflects the marginal private cost (MPC) of producing chemicals. The production of chemicals generates negative externalities. Hence, the presence of marginal external costs (MEC) in production leads to a divergence between the marginal private costs (MPC) and marginal social costs (MSC) curves.

The marginal external cost (MEC) increase as output increases. At low levels of chemical output, the pollution is negligible. The river dilutes the small amounts of pollutants discharged by the chemical factories. As the chemical output rises, so will the chemical discharge and the costs of pollution will rise sharply. Fishermen who are third parties suffer from a loss of income as they catch fewer fish.

The demand curve for chemicals is represented by the marginal private benefit curve (MPB) and it shows the additional satisfaction/benefit from each additional unit of chemicals consumed. In this instance, we assume that it is also the marginal social benefit curve for the whole of society, i.e. MPB = MSB (marginal social benefit).



Assuming perfect competition, the free market equilibrium output of the industry is OQ_e units where **MPC of production (or supply curve) =MPB of consumption (or demand curve).** However, at this output OQ_e , MSC (AQ_e) exceeds MSB of EQ_e. Thus, output Q_e is **allocatively inefficient**.

The **socially ideal output level** is at OQ_s units, where <u>MSC of production = MSB of consumption</u>. The free market equilibrium results in an overproduction of the good by Q_eQ_s units. The welfare loss to society, also known as the deadweight loss (measured in monetary terms), equals the sum of the excess of MSC over MSB for the amount of good overproduced. The deadweight loss is represented by area AEE₁

as the amount of resources used to produce an additional Q_eQ_s units exceed the gain in benefit from consuming Q_eQ_s from society's point of view.

Money value of benefits derived from output QeQs	= Area E₁EQsQe
Money value of resources used in producing output QeQs	= Area E₁AQeQs
Deadweight loss in producing output QeQs	= Area AEE ₁

The free market equilibrium is thus not allocatively efficient when externalities are present.

2.2.1.2 POSITIVE EXTERNALITY

The same economic framework can be used to analyse the welfare loss arising from positive externalities. An example of a good that generates <u>positive externalities in consumption</u> is education.

Figure 3 shows the market demand and market supply curves for education. Assume that there is no production externalities, hence the marginal private cost of production curve is the same as the marginal social cost of production curve (MPC=MSC).

The demand curve for education reflects the marginal private benefit curve (MPB) of consumption and it shows the additional satisfaction/benefit from each additional unit of education consumed. In the pursuit of self-interest, consumers only consider their own private benefits and the (free market) price they actually pay. In the case of education, consumers enjoy higher productivity and higher future earnings. However, in the pursuit of self-interest, they ignore the external benefits or positive externalities generated for the rest of society. For instance, a higher educated workforce leads to higher economic growth and in turn, greater ability by the government to collect taxes to help subsidise disadvantaged families. The presence of marginal external benefits (MEB) from consumption creates a divergence between the marginal private benefits (MPB) and marginal social benefits (MSB) from consuming education. This means that the marginal social benefit arising from the individuals' consumption of the good (MSB) is higher than the marginal private benefit (MPB) by the amount of the MEB (which is AC in the diagram below).

MSB = MPB + MEB

When MEB > 0, then **MSB > MPB**



From Figure 3, the <u>free market equilibrium</u> is at A with output at 0Qe units, where <u>MPB=MPC</u>. On the other hand, the <u>socially desired output level</u> is 0Qs units, where <u>MSB=MSC</u>. At the free market output level OQe, MSB exceeds the MSC of education. There is under-consumption of output by QeQs. Too little resources are allocated to the production and consumption of education. The deadweight loss is

represented by area ABC as the loss in benefit from not consuming QeQs exceeds the resources saved by not producing QeQs from society's point of view.

Money value of benefits derived from output QeQs = Area QeCBQs Money value of resources used in producing output QeQs = Area QeABQs Deadweight loss in not producing output QeQs = Area ABC

The free market equilibrium output OQe is thus allocatively inefficient. Hence, from society's point of view, there is under-consumption of the good. Too little resources are channelled to the production of education. By increasing the output of education, society gains more in social benefits than it incurs in social cost.

Summary

- Allocative efficiency is achieved when P=MC or MSB=MSC.
- Negative externalities in production leads to MSC>MPC by amount of MEC. The over-production of the good leads to a deadweight welfare loss for society. For every unit of the good over-produced, MSC>MSB and thus society wants less of the good.
- Positive externalities in consumption leads to MSB>MPB by amount of MEB. The under-production of the good leads to a deadweight welfare loss for society. For every unit of the good under-produced, MSB>MSC and thus society wants more of the good.

2.2.2 DEMERIT GOODS AND MERIT GOODS

DEMERIT GOODS

Demerit goods are goods that the government deems to be bad/undesirable/harmful for consumers and/or the rest of society. The government takes on a **paternalistic role** and perceives that consumers overconsume demerit goods because of two main reasons: (a) Personal well-being is not maximised due to imperfect information argument and (b) Externalities argument.

(a) Information failure affecting personal well-being argument: The defining characteristic of demerit goods is that demerit goods are **bad for consumers** but due to **imperfect information** regarding the marginal private benefits from consuming the good, consumers overvalue these goods and consume too much of these goods from society's point of view;

(b) Externalities argument: Incidentally, demerit goods can also generate significant negative consumption externalities. However, in the pursuit of self-interest, consumers ignore the negative consumption externalities and consume too much of these goods from society's point of view.

Hence demerit goods will be over-consumed if left to the free market, resulting in too much resources allocated to the production of these goods and hence, allocative inefficiency. Examples include alcohol, cigarettes, drugs and gambling.

(a) Imperfect information argument

The government takes on a paternalistic role. The government believes that consumers overvalue the good because of imperfect information about the marginal

private benefits arising from consumption of the good which causes the perceived MPB to be higher than the actual MPB.

The government thinks that consumers are likely to overestimate their private benefits from consuming demerit goods. For example, individuals may not be fully aware of the ill effects of consuming cigarettes – e.g. lung cancer and other related diseases. As a result of imperfect information, consumers overestimate their own **private benefits** from smoking. Hence if left to free market forces, consumers' demand for cigarettes under imperfect information is higher than the demand under perfect information.





Figure 4 shows the demand and supply curves of cigarettes. From figure 4, free market equilibrium (with imperfect information, DD₀) occurs at output OQe. However, the socially optimal level of consumption and production is at output OQs (where the true or full information value of an extra unit of the good equals its marginal social cost). Hence, if left to the free market, this demerit good will be over-consumed. Over-consumption of the good will result in a <u>welfare loss</u> to society represented by <u>area</u> <u>ABC</u> as the benefits gained from consuming Qe units of cigarettes is less than the resources used in producing Qe units of cigarettes.

Hence, there is a need for the government to intervene through the use of policies like education and campaigns to overcome the problem of imperfect information.

(b) Negative Externalities in Consumption argument

Consumption of demerit goods may generate significant negative third party effects but in the pursuit of self-interest, consumers ignore these negative consumption externalities. Hence, if left to the free market, the good will be over-consumed and too much resources will be allocated to the production and consumption of the good, resulting in allocative inefficiency.

Figure 5 below shows the demand and supply curves of cigarettes. The supply curve is the MPC of producing cigarettes. Assume that there are no externalities generated in the production of cigarettes, hence the MPC of producing cigarettes curve is equal to the MSC of producing cigarettes. The demand curve is the MPB derived from consuming cigarettes. However the consumption of cigarettes generates negative externalities. Hence, there is a divergence between MPB and MSB. MSB from consuming cigarettes is less than MPB from consuming cigarettes.



To the consumer, the marginal private benefit from consuming cigarettes includes the satisfaction derived from consuming it (e.g. the consumer feels happy; his stress level is reduced). However, consuming cigarettes generates negative externalities. For instance, when consumers consume cigarettes, non-smokers around them inhale third party smoke which is toxic. Non-smokers may fall sick and incur medical costs but they are not compensated by the smokers.

Because this is a consumption externality, it is the demand (or consumption) side where costs occur. The negative externalities arising from consuming cigarettes creates a **divergence between MPB and MSB where** the MSB is less than the MPB. In other words, the benefit of a cigarette that is enjoyed by the smoker is greater than society's benefit. Others will eventually pay some of the costs of this smoking (in higher insurance premiums or taxes for government health programmes). This cost to others actually reduces the overall benefit to society.

If left to the free market forces, OQ_e is produced and consumed where MPB = MPC. On the other hand, the socially optimal level of production and consumption of cigarettes is OQ_s where MSB = MSC. A deadweight loss of ABC is generated in the consumption of cigarettes if left to free market forces. Hence, there is a need for the government to intervene through the use of policies like indirect taxes and quotas on cigarettes.

Note: This analysis and economic framework can be applied to markets with negative externalities in consumption. e.g. market for alcohol, market for gambling services, etc.

MERIT GOODS

Merit goods are goods that the government deems to be good and beneficial to consumers and/or the rest of society. The government takes on a paternalistic role and perceives that consumers under-consume merit goods because of the following reasons:

(a) Personal well-being is not maximised due to

(i) Imperfect information regarding private benefits and/or costs argument The defining characteristic of merit goods is that merit goods are good/ beneficial to consumers themselves but due to imperfect information regarding the marginal private benefits from consuming the good, consumers undervalue these goods (personal well-being argument) and consume too little of these goods;

(ii) Inability to pay argument

In countries with excessive income inequality, there will be groups of people who do not have the ability to pay for basic education, healthcare and so on. Due to the **inability to afford** these goods, consumers consume too little of these goods.

(b) Externalities argument due to the pursuit of self-interest.

Incidentally, merit goods can also generate **significant positive consumption externalities.** In the pursuit of self-interest, consumers ignore the positive consumption externalities (externalities argument) and consume too little of these goods;

Hence merit goods will be under-consumed if left to the free market, resulting in too little resources allocated to the production and consumption of the good and hence, allocative inefficiency. Examples include healthcare services and education.

(a) Personal well-being is not maximised argument

(ai) Imperfect information argument

The government believes that individuals are likely to underestimate their personal benefits when consuming merit goods. If left wholly to the private sector, it is likely that merit goods will be under-consumed because individuals undervalue their own benefits which results from the consumption of goods such as health care and education. The argument concerning imperfect information is an important one. Parents with relatively poor educational qualifications may be unaware of long-term benefits that their children might derive from a proper education. Because the knowledge of these private benefits is an ongoing learning process, individuals themselves will tend to underestimate the long term gains from a proper education. The long term private gains from receiving a proper education include higher potential earnings over one's working life.



From Figuree 6, free market equilibrium (under imperfect information, DD₀) occurs at output Qe. However, the socially optimal level of consumption and production is at output OQs (with perfect information). Hence, with imperfect information, too little resources will be diverted to the consumption and production of education. A welfare cost represented by area ABC arises from imperfect information as the benefits lost in not consuming QeQs units of education exceeds the resources saved in not producing QeQs units of education.

Hence, when left to the free market, merit goods will be under-consumed and underprovided from society's point of view. In other words, too little resources are allocated to the production and consumption of the merit goods from society's point of view. Market failure results as there is allocative inefficiency under an unregulated free market system. Thus, government intervention may be necessary to bring about allocative efficiency.

(aii) <u>Unequal income distribution argument</u>

In a free market economy, an individual's ability to consume goods & services and the allocation of resources depends on the dollar votes, which is dependent on individual's income or other resources such as savings. An excessive unequal distribution of income and wealth may result in a misallocation of resources as the free-market will not always respond to the needs and wants of people with insufficient dollar votes. What matters in a market based system is <u>effective demand</u> (<u>willingness</u> and <u>ability</u> to pay) for goods and services. In countries with excessive income inequality, there will be groups of people who do not have the ability to pay for basic education/healthcare etc.



From Figure 7, the free market will allocate resources based on the dollar votes, where DD = SS and produce at 0Qe units of output. However, society's welfare will improve if income is less unequal, as that will cause the effective demand to increase from DD_0 to DD_1 , and output is at OQs.

(b) Positive externality (in consumption) argument

Consumption of merit goods may generate positive externalities. When left to the free market, such goods will be under-consumed because consumers ignore the external benefits that result from their consumption of these goods (e.g. education and health services). This under-consumption will lead to a welfare loss to society.

Summary

- Demerit goods are goods that the government deems to be undesirable for society. The market failure for demerit goods arises due to imperfect information (consumers not aware of full costs of consuming the good) and negative externalities in consumption.
- Merit goods are goods that the government deems to be beneficial to society. Market failure for merit goods arises due to imperfect information (consumers not aware of full benefits of consuming the good), inability to pay (due to income gap in the country) and positive externalities in consumption.

2.2.3 PUBLIC GOODS

Public goods are difficult to provide commercially through the marketplace because it is extremely impossible or extremely costly to exclude non-paying customers from enjoying the good once it is produced. This is because public goods possess two distinguishing features – **non-rivalry** in consumption and **non-excludability**. As such, public goods will typically not be supplied through the market.

A good is **non-excludable** when it is impossible or very costly to exclude non-payers from consuming the good once it is provided. Since those who do not pay cannot be excluded, no one has incentive to help pay for such goods and suppliers will find it difficult or impossible to collect fees for the benefits they provide. This is called the <u>'free rider' problem</u>. When a large number of people become free riders, either none or not very much of the public good is produced through the free market. For example, in the case of radio broadcast signals, it is extremely difficult to exclude those in the same vicinity from receiving the radio broadcast signals once the signals are available to someone in the vicinity. Another example is national defence. Even though it is very valuable, it will still either be not supplied or be undersupplied by the market. For example, suppose national defence were provided through the market. Would you voluntarily help to pay for it? Even though many citizens might value defence highly, they would become free riders and few funds would be available for the finance of national defence. For this reason, government supplies many public goods.

A good is **non-rivalrous** when the consumption by one person does not reduce the amount available to others. For example, a radio broadcast signal can be shared by everyone within the listening range. If an additional listener turns on the radio, this does not reduce the amount of the signal available for other listeners. Thus, the marginal cost of allowing an additional user/listener to share in the usage of the good is zero. Since the supply of a public good is not depleted by an additional user, the marginal cost of serving an additional user is zero. That is, once the public good is zero. Since the marginal cost of serving an additional user is zero. That is, of the good is zero. Since the marginal cost of serving an additional user is \$0, efficient provision of public goods requires that consumers pay the marginal cost of their consumption which is zero. However, private markets with profit-maximising firms will never provide goods at a price of zero. And any non-zero price would discourage some users from enjoying the public good. This would be allocatively inefficient since one more person's consumption of the good costs society nothing.

Summary

Public goods are difficult to provide commercially through the marketplace due to non-rivalry and non-excludability in consumption. Non-excludability means nonpayers cannot be excluded from consuming the good. This leads to a problem of free-ridership. Non-rivalry means the quantity of the good does not reduce with increased consumption. Thus the good can be provided to an additional user at zero marginal cost. Due to the complete market failure of public goods, the government directly provides public goods.

3. GOVERNMENT INTERVENTION

3.1 RATIONALE FOR GOVERNMENT INTERVENTION

Why governments intervene

- Governments intervene in the free market, to achieve its economic goals. These goals include the microeconomic goals of *efficiency* in resource allocation (productive and allocative efficiency) and *equity* in the distribution of a nation's income and wealth, as well as macroeconomic goals.
- With respect to its microeconomic goals, governments seek to correct the distortions that exist in the free market which result in inefficient resource allocation and unequal income distribution, i.e. to correct **market failure**.

Tip/Question:

Public libraries and public buses are not public goods. Why? Sometimes the main microeconomic objectives of efficiency and equity cannot be achieved by the free market and hence, governments will have to intervene in the operations of markets. However, when governments attempt to achieve these aims, there is also the possibility that they may fail and may worsen rather than remove distortions. Society has to decide whether market failure or government failure (refer to section 8 for a detailed explanation on government failure) is a greater problem.

When circumstances exist to distort the efficient allocation of resources to maximize society's welfare, government intervention is sometimes required. The different types of policies are usually classified under four broad categories:

- 1. Taxes and Subsidies (market-based policies)
- 2. Legislation and Regulation
- 3. Direct government provision and
- 4. Education, Campaigns and Advertisement.

3.2 TAXES AND SUBSIDIES (MARKET-BASED POLICIES)

The government uses financial intervention in the form of taxes (compulsory payment to the government) or subsidies (cash transfer from the government to the producer or consumer) to influence the behavior of producers and consumers ("People respond to incentives").

TAXES ON GOODS WITH SIGNIFICANT NEGATIVE EXTERNALITIES

In the case of <u>negative production externalities</u>, the government can levy an indirect tax (e.g. specific tax) equivalent to the value of the marginal external cost. This is a monetary valuation of the harm imposed on society due to the negative externality, brought about by production per unit of output produced by the firms. Through this indirect tax, the government attempts to compel the polluting firm to *internalise the external costs*.



In Figure 8 above, a specific tax of E_1B which is equal to marginal external cost (MEC) at OQ_s will raise the firms' marginal private cost, shifting it from MPC to MPC + Tax, i.e. MSC. This leads to an after-tax equilibrium quantity of $0Q_s$ units. The tax has resulted in a lower equilibrium quantity, which is also the optimal quantity. This is because the indirect tax has caused the price that consumers actually pay to increase from P0 to P1, hence the quantity demanded falls from Qe to Qs. At this equilibrium, Marginal Social Benefit (**MSB**) equals Marginal Social Cost (**MSC**). The overallocation of resources is corrected as there will not be over-production. This eliminates the deadweight loss (AE₁E) arising from over-production prior to the imposition of the tax. Allocative efficiency is achieved at the output of OQ_s .

Distinguishing between a tax on output and a tax on pollutants (emissions)

Both a tax per unit of output produced and a tax per unit of pollutants emitted appear to have the <u>same result</u> in that <u>they can lead to lower pollution levels</u>. <u>However, they work quite differently</u>. A tax per unit of output works directly by correcting the over-allocation of resources to the good, decreasing the output produced towards the optimal quantity Qs. A tax per unit of pollutants, such as a carbon tax, is intended to work by creating incentives for the firm to buy fewer polluting resources (such as fossil fuels), and to switch to less polluting technologies (alternative energy sources).

If the firm eventually switches to less polluting resources, the external costs (MEC) of producing output will fall, thereby shifting the MSC curve to the right. In other words, the socially optimal output has increased, making it closer to the free market output.

Governments can correct <u>negative consumption externalities</u> based on the same principle. For example, in the case of goods such as alcohol or tobacco, the government can impose high taxes on producers, in order to deter consumption. In figure 9 below, when a specific tax of E1A which is equal to MEC at Qs is imposed on the producer of such a good, it leads to an increase in the marginal private costs of production, resulting in a decrease in supply. This will cause a rise in the price of this good and a reduction in the final quantity traded in the market to the optimal level of 0Qs, where MSB = MSC. The deadweight loss (AES) is eliminated and the overconsumption of the good is corrected.





Other Merits / Advantages

- Taxation provides revenue for the government to finance other projects such as social and community development projects. E.g. revenue from a tax on cigarettes can be used to fund a major health education program or go into subsidising research on how to help smokers overcome their addiction.
- Although the imposition of a tax on the production of a good distorts market forces, the indirect tax still allows the market to continue to operate according to market forces and reach a state of equilibrium. Hence, consumer sovereignty is still present.

Limitations

 The policy requires accurate valuation of the external cost which in practice is difficult. An over-valuation of external cost means that output is reduced to a level that is below social optimum. An under-valuation of external cost implies that although output is lowered by the tax, it is not enough to bring output down to the socially optimal level. With the lack of precision, society's welfare cannot be maximised.

Nonetheless, it has often been argued that in spite of inaccurate valuation, the imposition of a tax does reduce the extent of the deadweight loss. This may be better than no intervention at all.

 The ability of using tax in reducing consumption levels is constrained by the price elasticity of demand. If demand is highly price-inelastic, to achieve the desired reduction in output, a higher tax will be required as compared to a good with relatively price-elastic demand. For instance, a small tax imposed on cigarettes will have little effect in reducing consumption of cigarettes due to the addictive and habitual nature of the product.

Despite the price elasticity of demand affecting the extent of tax to be imposed, insofar as the tax is equated to MEC and the MEC is accurately gauged, consumption will fall to the socially optimal level.

SUBSIDIES ON GOODS WITH SIGNIFICANT POSITIVE EXTERNALITIES

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.

Figure 10 illustrates a case of a <u>positive externality</u> <u>due to production</u> such as that generated by a firm that engages in research and development, allowing for new technology to spread throughout the economy. <u>An indirect subsidy of an amount</u> <u>equal to the MEB at OQs (BE) to the producer</u> will shift the supply curve from MPC to MSC. By lowering the private cost of research and development, the government can induce the firm to consider external benefits when it undertakes such activities and encourage more of these to be undertaken. The equilibrium output from OQe increases to the socially optimum level, OQs where MSC=MSB. The underproduction of research would be corrected as the positive externality is said to have been 'internalised'. The deadweight loss to society (AES) is thus eliminated. In most cases, we assume that the subsidy is on the firm/producer.

Indirect Subsidy to Producers



Governments can correct <u>significant positive consumption externalities</u> based on the same principle. For example, in the case of goods such as education and healthcare which are under-consumed and hence underprovided if left to the free market, subsidies to the producers such as grants given to schools would lower the marginal private cost of education to the public. This reduction in cost of production will

translate to lower education fees. Fig 11 shows the effect of the provision of a subsidy to the producer of a merit good such as education. With a subsidy of an amount equal to the MEB at OQ_s (EB) to the producer, the supply curve shifts downwards from MPC to MPC (- indirect subsidy). Under-consumption of education is corrected as the quantity of education rises from OQ_e to OQ_s and the positive externality is said to have been 'internalised'. The deadweight loss to society (AES) is thus eliminated.



In Figure 12, the equilibrium level of consumption without government intervention is at $0Q_e$ where MPC = MPB. With government intervention, a direct subsidy equal to the MEB at $0Q_s$ of amount CD given to consumers will shift the demand curve from MPB to MSB as consumers are 'encouraged' to increase consumption, resulting in the socially optimal level, 0Qs where MSC = MSB. The under-allocation of resources would be corrected as the positive externality is said to have been 'internalised'. The deadweight loss to society is thus eliminated.

An example of such a direct subsidy to consumers would be the Singapore government's financial aid to working mothers to help alleviate the costs of sending their children to childcare centres. This direct subsidy would increase the purchasing power of working mothers and thus increase demand and consumption for services of childcare centres. Another example of a subsidy to consumers would be the Baby Bonus Scheme, where the savings accounts of children are matched dollar-for-dollar by the government, in the attempt to defray the costs of healthcare and education associated with raising children. Such a direct subsidy would raise the demand for healthcare and early childhood education (as these savings accounts can only be used for specific purposes).

Merits / Advantages

- A subsidy is considered the most effective way to correct the misallocation of resources arising from positive externalities since it can be easily implemented to bring about an increase in production and consumption and flexible enough to be adjusted according to the magnitude of the problem.
- It also has the advantages of *internalising* positive externalities and still allows the market to operate (though distorted by the subsidy). Subsidy thus seeks to change the relative prices faced by economic agents in the hope that this will change their behaviour as it forces firms and consumers to take into account the full social costs and benefits of their actions.

Demerits / Disadvantages

- The valuation of the external benefit generated at the social optimal output level is, in practice, a difficult task. Over-estimation will lead to the overconsumption of the good. Under-estimation will lead to a less than optimal consumption though this level is at least more than the market equilibrium level.
- High government expenditure is required to finance the subsidy. For instance, from Figure 12, the total government subsidy is equal to P₁P₂CD. This may require high direct tax rates like personal income tax rates and corporate tax rates that can subsequently discourage work effort and investment in the country respectively.

3.3 <u>GOVERNMENT LEGISLATION OR REGULATION (COMMAND AND</u> <u>CONTROL)</u>

Government legislation and regulation is a powerful tool to correct market failures arising from the presence of significant **externalities and information failure (merit and demerit goods)**. The market provides the good but government regulation through laws and administrative rules provides the process of controlling its production or consumption activities.

For instance, the government can pass legislation to prohibit or regulate behaviour that imposes an external cost. Laws can be used to force 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. In 2013, China initiated a new set of anti-pollution measures including the compulsory installation of pollution abatement equipment to reduce the amount of carbon soot released into the atmosphere. In addition, China was vigilant in closing dozens of coal-fired plants to lower toxic emissions. Firms that were unable to meet the standards were punished through hefty fines.

There are many different types of legislation that can be used. Some examples include setting a quota, banning certain items, setting safety standards and compulsory action by consumers. Examples of laws and regulations implemented by the Singapore government to correct market failure arising from externalities, merit and demerit goods include banning the sale of chewing gum, regulating the consumption of cigarettes to designated areas and passing laws to ensure that primary school education is made compulsory.

3.3.1 CASE STUDY – QUOTA

A quota is a limit on the quantity of a good produced. Assume that the industry produces chemicals and in its production of chemicals, generates negative externalities when it dumps wastes into the river. The free market equilibrium output level in Figure 13 is Q_e where MPB=MPC. However, the production of chemicals generates negative externalities, causing a divergence between MPC and MSC by the amount MEC. The socially optimal output level is Q_s where MSB=MSC. To

Question to Ponder:

The level of subsidies on education varies across countries. Does this indicate the problem of inaccurate valuation of external benefits? achieve the allocatively efficient output level and eliminate the deadweight loss of AEE₁, the government can impose an <u>output quota</u> and limit the amount of chemicals produced to 0Q_s.



Figure 13: Correcting Negative Production Externality (Quota)

Merits/Advantages

- Legislation and regulation like output quotas are <u>simpler to implement</u> compared to market-based measures such as taxes. The technical difficulties involved in formulating a pollution tax often make it more practical to impose regulations that limit quantity produced which in turn limit the amounts of pollution firms can emit.
- Legislation and regulation like output quotas result in <u>greater certainty</u> in achieving its targeted output level than taxes. Regulation compels producers and consumers to comply and reduce output and in turn, pollution levels to its targeted level, which taxes may not always do. For these reasons, regulations are far more commonly used as a method to limit negative externalities of pollution in countries around the world.

Demerits / Disadvantages

If a quota is implemented, it <u>displaces the price mechanism</u>. This means that the output level is no longer responsive to changes in its price. In the absence of price signals, the onus lies on the government to predict as best as it can the socially desired level of output. However, the government also does not have perfect information. Given these limitations, legislation and regulations can at best be only partially effective in reducing the pollution created.

Furthermore, in order to design good rules, the government needs to know the details about specific industries and about the alternative technologies that those industries could adopt. However technical information on the different types and amounts of pollutants emitted is often difficult to assess. Hence, due to the <u>lack of perfect information</u>, quantity controls may lead to **government failure**.

- In addition, output quotas <u>do not create market-based incentives</u> for firms to use less polluting resources that could significantly lower the extent of the negative externality.
- Another problem with using legislation or government regulations like output quota is that <u>enforcement of such laws may be difficult and expensive</u>. Constant checking is needed and this can translate into high costs for the government. In addition, for the law to be effective, the <u>penalties for breaking the law must be</u> <u>sufficiently harsh</u>.

Nevertheless when businesses create externalities that are detrimental to society (e.g. factories dump poisonous chemicals into water supply), the benefit of controlling these externalities may partly offset the inefficiency arising from quantity controls. Given that there is a trade-off between benefits from controlling externalities and the

costs arising from implementing these controls, society can be said to benefit from such schemes only if the net effect is positive.

3.3.2 CASE STUDY - TRADABLE PERMITS SYSTEM OR "CAP AND TRADE"

With a greater awareness of the need for sustainable development in the world, a relatively new and an increasingly popular policy option in dealing with pollution is the issuance of tradable permits.

In the tradable permits system (also known as cap and trade or emissions trading system) permits to pollute are usually issued to firms by a government or an international body and can be traded (bought and sold) in a market.

In the case of greenhouse gas emissions, each firm is granted by the government a particular number of permits (or rights) to discharge a defined quantity of greenhouse gas into the atmosphere over a period of time. The permits to pollute can be bought and sold among interested firms, with the price of permits being determined by the market demand and supply. If a firm can produce its product by emitting a lower level of pollutants than the level set by permits issued to it, it can sell its unused permits in the market. If a firm needs to emit more pollutants than the level set by its permits, it can buy more permits in the market, failing which it will face heavy penalties.

In effect, this system penalises the buyer (of permits) for polluting, and rewards the seller (of the permits) for having reduced emissions. There are currently several trading systems in place with the largest being in the European Union. The carbon market makes up the bulk of these and is growing in popularity.

How does a tradable permit system work?

Using the basic demand and supply framework, it is easy to examine how the tradable permit system works. Figure 14 shows a market for tradable pollution permits. The total number of permits distributed to firms is capped by the government, hence its supply is perfectly price inelastic. Together with the market demand for permits, the equilibrium price of permits is determined. As the economy grows and the firms increase their production of goods and services, the demand for permits is likely to increase from D_1 to D_2 . With supply fixed at Q_1 , the price of these permits rises from P_1 to P_2 .



In the event that the socially optimal level of pollution falls in the future, the government can then reduce the quota for tradable permits. Figure 15 shows a fall in the quota for tradable permits, shifting S_1 curve leftwards to S_2 curve. The price of these permits rises from P_1 to P_2 , ceteris paribus.

Merits / Advantages of a tradable permit system

- By setting a limit or a cap on the level of permissible pollution, a socially optimal level of emissions can be targeted and a reduction in overall pollution level is highly possible. By imposing a quota on the level of emission, the government can achieve its desired level much more effectively than using taxes and subsidies. Every year, the government can progressively reduce the number of permits issued according to the magnitude of the current pollution problem. As a result, total pollution in the affected industry will reduce over time. This is unlike a tax on pollution, which requires an accurate valuation of the external costs.
- Tradable Permits System is more cost-effective than regulation.

If firms can cut back on their emissions at a relatively low cost (low abatement cost), it is in their interests to do so and sell their excess permits for a profit. Firms that can only reduce pollution at high cost (high abatement cost) will be forced to buy additional permits. In this way, most of the greenhouse gases are reduced by firms that can reduce emissions using relatively low cost procedures. This allows pollution to be reduced at a lower cost to society than using regulation.

The system encourages the promotion of cleaner and greener technology to reduce pollution as it provides firms with the incentives to reduce their emissions further since they can sell any their excess permits for a price.



Figure 15: The Market for Tradable Permits

Demerits / Disadvantages

Tradable permits, like pollution taxes, pose problems of implementation. Some of these involve technical difficulties, high cost in measuring pollution, and high cost in setting up a mechanism of monitoring and verifying actual emissions as noted below.

 If the government is too generous in the number of permits issued, the desired level of emissions level will not be achieved. Tradable permits also require the government to determine not only the amount of pollutants emitted but also to set a maximum level for each type of pollutant for which permits will be distributed to the polluting firms. The latter task involves having technical information on how much of each pollutant is acceptable from an environmental point of view which is often debatable. Up to today, there is much controversy among scientists over the extent of harm caused by each type of pollutant. This makes it difficult in accurately measuring and attaining the socially optimal level of emissions.

- Fines for non-compliance will need to be high enough to ensure that firms do not try to cheat the system; otherwise, firms may attempt to deceive the regulators rather than pay for the permits. The greater the number of firms, the more difficult it is to enforce the policy, and hence the higher the number of regulators needed to be employed to enforce the policy. This will result in high administration costs.
- A method must be found to distribute permits to polluting firms in a fair way. Issues of political favoritism may come into play as governments give preferential treatment to their supporters.

3.4 DIRECT GOVERNMENT PROVISION

Public goods

Direct government provision in the case of public goods means that the government supplies the goods and services directly to consumers usually free of charge at the point of use. The government can choose to produce the goods and services itself or it may buy the services of firms from the private sector.

In correcting the market failure due to zero provision of <u>public goods</u> (for example, national defence and street lighting), the government's only feasible option is to provide these goods and services directly. For instance, the Singapore government provides national defense and street-lighting directly and funds their production through taxes. The Ministry of Defense manages the army and the Singapore Land Transport Authority manages the street lights along public roads since the free market often cannot provide such **public goods**.

The process of direct government provision again entails economic decision making on the part of the government. The government must decide the kind of public goods to provide and in what quantities. The government must use economic criteria to decide which public goods will provide the greatest social benefits for a given amount of money to be spent on providing the goods. The government must compare the social benefits against the social costs of providing these goods. Allocative efficiency requires that the MSB equals the MSC.

Advantages:

Without government intervention, public goods would simply not be provided. A *missing market* in this case may indicate a *significant loss* to society's welfare. In such a case of complete market failure, the government can intervene through the direct provision of public goods.

Limitations:

The government must decide the kind of public goods to provide and in what quantities. Limited funds force choices on what public goods to produce, and each choice has an opportunity cost in terms of other goods and services that are foregone.

Governments must use economic criteria to decide which public goods will provide the greatest social benefits for a given amount of money spent. Herein lies the major difficulty in calculating expected benefits, i.e. ascertaining the market price of the good as 'concealed demand' implies that firms cannot gauge demand nor set a price. Demand for such goods can thus only be estimated through surveys or votes.

The direct provision of public goods is financed through the taxes that the government collects. This means that there will be distortions and opportunity cost associated with acquiring these taxes, and society's welfare could be reduced.

Merit goods

Although **merit goods** are provided by the market, the free market equilibrium output level is lower than the social optimum. The government therefore intervenes by providing certain merit goods like public education and public healthcare services to supplement those provided by the private sector. The government often also uses subsidies to induce lower prices so as to increase consumption towards the socially optimal level. Examples include subsidised healthcare in public hospitals, free childhood vaccinations at polyclinics in Singapore, education subsidies for Singapore Citizen children enrolled in public schools up to secondary education. [Recall that a merit good is a good whose consumption is deemed desirable by the government and therefore encouraged e.g. education, healthcare and housing.

Merits / Arguments for Direct Provision

 The advantage of direct provision is that the government has control over the supply of public and merit goods and services. By controlling the supply of these goods and services, the government can control or influence their number, quality and affordability. For instance, the government determines the number of street lights along public roads, the number and quality of public schools and the number and quality of hospital beds by providing them directly to consumers.

Problems with Direct Provision:

- The disadvantage of direct provision is that the production may be inefficient as employees of the state tend to have little or no incentive to keep costs at a minimum due to the lack of profit-motive.
- The choice of which good or service to provide, and how much of it to provide, involves the usage of Cost-Benefit analysis (Appendix B). In this approach, the amount of social benefits expected in relation to the cost of providing the good or service has to be specified, so that the good is provided only when social benefits outweigh the costs of provision. However, it is in practice difficult to measure the size of external benefits and hence, the level of support the good should receive. Hence, allocative inefficiency may still be present and the government may provide too many schools and not enough hospitals.
- Direct government provision, similar to subsidies, involve the use of government funds that rely on tax revenues. These funds have many alternative uses, each of which has an opportunity cost. Hence, it is not possible for the government to directly provide all goods and services. Choices must be made.

Hence, in the real world, governments are unable to perfectly correct the underconsumption. The most it can hope for is that direct provision is a step in the right direction.

1.5 JOINT PROVISION

In general, joint provision refers to an arrangement between two or more parties to co-operatively plan, design and in some cases manage a project or provide a service. In practice, the model of joint provision may vary from government to government. However, joint provision as opposed to direct provision by the government is that there is some form of partnership between the government and the private sector in the provision of a good or service. In Singapore, the Public Private Partnership (PPP) framework has been in adopted since 2004 to encourage public agencies to engage private sector providers in delivering non-core government services if it is more efficient to do so.

Conventionally, public agencies have only engaged the private sector to construct facilities or supply equipment. Public agencies will then own and operate the facilities

or equipment to deliver services. For example, a public agency might engage private companies to build a flood management system. Upon completion, the public agency will own and operate the flood management system to provide flood drainage services to the public. With PPP, the public sector will focus on acquiring services in the most cost -effective manner, rather than directly owning and operating assets. For example, if PPP is used to develop a flood management system, the private sector will be engaged to not only construct the plant, but also to design, operate, maintain and secure financing to build the system. Hence, instead of owning and operating the flood management services directly from the private sector.

Merits / Arguments for Joint Provision

By delegating the ownership, management and production of services to the private sector, the private sector firms have a stronger incentive to keep costs down due to the profit motive. Hence joint provision allows the government to acquire these services from the private sector at more competitive rates, hence improving overall cost efficiency in such joint provision of public sector services.

Moreover, these private sector, being driven by profit seeking motives, would be incentivised to introduce innovation into the delivery of public services, thus improving the quality and cost efficiency in service delivery to consumers. This also has the added benefit of lowering the tax burden in financing the delivery of services.

Problems with Joint Provision:

Notwithstanding the above benefits of joint provision, the PPP model of joint provision does come with its own set of challenges. The success of such a model depends on sector and project type. PPPs in the utilities sector tend to be more successful. On the other hand, in the case of the development of Singapore's airport extension, Changi Terminal 5, the government has opted not to adopt the joint provision PPP model. This is because having different airport operators across all five terminals would mean that there is a possible problem of achieving consistency in service delivery standards and quality of systems. Privately-run national airports, such as Heathrow airport, have been plagued by accusations of underinvestment and declining standards as owners seek to rein in expenditures. This is particularly important for delivery of key services as the airport services. As the port-of-entry, quality and user experience at the airport is synonymous with the Singapore experience. For many Singaporeans, Changi Airport comes close to being a national icon. Having a government-linked corporation in charge of the operations of the terminal would give the government greater say and control in the intricacies of the project, and by extension, the overall consumer experience.

In general, infrastructure projects that have strong social and symbolic elements appear to be less suited for this form of partnerships, largely attributed to the active public sector interest involved in these facilities. The Singapore Sports Hub, for example, has been plagued by complaints of low quality and faulty amenities. In one instance, Chinese pop star Jay Chou's concert at the Sports Hub was marred by sound problems, prompting concert-goers to petition for a refund. Public furore also erupted over the initial \$26 million rental fees the Sports Hub wanted to charge the government for National Day Parade (NDP) rehearsals. The NDP saga shows that Singaporeans inevitably expect the private management company to discount commercial interests for the collective good of the nation, especially for facilities that have historic or national significance. The problems arising from the Sports Hub – the first PPP of such magnitude and complexity – might have influenced the government's final decision to rule out the possibility of private sector cooperation in the building of Terminal 5 altogether. Joint provision via private-public partnerships are not the panacea to all infrastructure development projects

3.6 EDUCATION AND CAMPAIGNS- MANAGING IMPERFECT INFORMATION

Possible government responses to the problem of imperfect information are the provision of information through education and campaigns.

To protect consumers in their purchasing decisions, the government may respond by educating consumers via campaigns or advertisements, or supplying information directly to them. Producers could also be forced to provide accurate information to consumers. In this way, the external cost or the real benefit from the consumption of certain goods is made known to consumers. As a result of these initiatives, demand for goods would ideally be discouraged in the case of demerit goods and ideally be encouraged in the case of merit goods. It is hoped that private demand would move to socially desirable levels, causing firms to produce at levels (the equilibrium output) that correspond with the optimal output.





Consumers tend to undervalue healthcare services due to imperfect information and hence consume too little healthcare services from society's point of view. If consumers have perfect information about the private benefits arising from consuming healthcare services, their demand for healthcare services will increase. Referring to Figure 16 above, demand for healthcare services would ideally rise towards the socially optimal level (from OQ_e to OQ_s) when consumers are accurately informed of their private benefits from consuming healthcare services. For example, preventive health care such as immunisation and annual health check-ups can prevent serious diseases, but the lack of knowledge about the benefits may lead to too little demand of these services. When the government educates consumers via campaigns or simply necessitating information provision via healthcare providers, consumers will ideally increase their demand for these services from OQ_e to OQ_s , thus maximising their well-being and in turn, society's well-being.

Evaluation:

If imperfect information is the source of market failure, education and campaigns tackle the source directly.

However, education and campaigns are expensive methods and require a long period of time to bear fruit. If the external costs associated with negative externalities are serious and must be dealt with immediately, other measures such as indirect taxes need to be used alongside these.

When the government provides information, there are difficulties and costs involved in collecting and disseminating all necessary information to consumers. When the producer is the provider of the information, there are serious questions as to whether these are accurate and complete. It is sometimes not possible to eliminate imperfect information because there is always room for the seller to hide some information from the buyer.

Food for thought: Can market failure arising from externalities be corrected through education and campaigns?

Summary

For public goods, it is usually provided with no direct charge to correct for the total failure of the free market to provide the good. For merit goods, apart from subsidies, a government can also directly provide such goods.

For imperfect information, the government corrects such market failure through the provision of information through education and campaigns. This may reduce the demand for demerit good and increase the demand for merit goods to align to the socially optimal level.

APPLICATION TO THE SINGAPORE ECONOMY

4.1 SOLVING TRAFFIC CONGESTION & AIR POLLUTION (NEGATIVE EXTERNALITIES)

Car usage generates significant negative externalities. However, in the pursuit of selfinterest, car users ignore the negative externalities that are generated. For instance, when people use their cars, not only do they incur <u>private costs</u> like the cost of petrol, oil, wear and tear and so on, they also cause <u>third party effects</u>. These negative externalities include pedestrians suffering from exhaust fumes, other car uses caught in traffic congestion, noise pollution to homes located along congested roads. These negative externalities translate into external costs like higher medical costs and loss of productivity of third parties. In Singapore, due to her limited land space, rising income and increased population, traffic congestion is a growing problem.

As shown in Figure 17, under free market forces, the amount of road usage by commercial vehicles will be at OQ_e where MPB=MPC. On the other hand, the allocative efficient level of road usage is OQ_s where MSB=MSC. A deadweight loss of ABD is generated in the usage of road if left to free market forces. Hence, there is a need for the government to intervene through the use of policies like Electronic Road Pricing (ERP), Certificate of Entitlement (COE) and Public Transportation.



Figure 17: Negative externality in production by commercial road vehicles

Policy 1: Managing Car Usage – Congestion Charges: Electronic Road Pricing

Congestion charges work by requiring motorists to take into account the cost of congestion borne by others as a result of their driving. The Electronic Road Pricing(ERP) system works like a tax. Under the ERP system, a congestion charge

 (P_2P_3) equivalent to the MEC (BC) as seen in Figure 17 is deducted electronically whenever a vehicle uses a priced road. Motorists are encouraged to decide whether to drive, when to drive and where to drive. They may choose a different route, mode of transport, time of travel, or not travel at all. Those who choose to pay and stay on the road will enjoy a smoother ride. As a result of the ERP, the external costs would be internalised. The market is now allocative efficient and the allocative efficient level of road usage, OQs, is achieved.

Evaluation of ERP

Merits/Arguments for ERP:

- Congestion charging is the most direct way of tackling congestion as it tackles road usage. ERP enables congestion to be managed in a more targeted way. Charges vary by time and location, based on traffic speeds on the roads. Through regular rate reviews, ERP charges are adjusted upwards or downwards to keep traffic flowing smoothly, while not underutilizing the roads.
- It is fair as charges are based on usage so those who contribute more to the congestion pay more. Those who use the roads less frequently or who travel during non-peak hours will pay less.

Demerits/ Problems with ERP:

 Public acceptance is a key stumbling block to its widespread adoption internationally. This is because congestion pricing entails the pricing of a service – travel on urban roads – that was previously provided 'free'.

Policy 2: Managing Car Ownership - Output Controls (Quotas): COEs in Singapore

A good example of output control or **<u>guota</u>** can be seen in Singapore's Certificate of Entitlement (COE) Scheme which <u>**limits car ownership**</u> and the number of cars on the road. In order to purchase a car, buyers have to purchase a COE from the government. The number of COEs released each year is determined by the targeted vehicle growth rate. This is aimed at reducing <u>traffic congestion and air pollution</u> (negative externalities).

According to Figure 18, the free market equilibrium output level is OQ_e . However, assuming that the allocative efficient number of cars is OQ_s , there is an over consumption of cars by Q_sQ_e . The COE (or the quota) can limit the maximum number of cars sold to OQ_s . This can help to mitigate traffic congestion <u>indirectly</u> by limiting the number of cars on the road.



Figure 18: Imposition of a COE (Quota) in the car market

Evaluation of COE policy

Merits/Arguments for COE policy:

- Limiting car ownership and hence number of cars on the roads can lead to reduction in air pollution and more efficient (less congested) transport network.
- Since the producer of COEs is the government, the COE premiums collected goes to the government who uses the revenue collected for financing land transport and public transport development that benefit society at large. Car taxes and COE premiums account for about 13% of the Singapore government's total operating revenue.

Demerits/ Problems with COE policy:

- Congestion is due to car usage and not the ownership of cars. Thus ownership measures are a **blunt instrument**. Ownership controls cannot target localised congestion unless car ownership is curbed to a very large extent. Beyond a certain level, heavy ownership costs are an inefficient way of managing traffic congestion.
- High car ownership costs may have the perverse effect of increasing car usage. Once a car is bought, it is used very intensively. Having paid heavily upfront for a car with a limited period for use before it has to be scrapped (COE allows a car to be used for 10 years), car owners tend to drive as much as they can. A more efficient approach would be to control car usage directly through usage pricing.
- The COE (or quota) causes the price of cars to increase from P0 to P1, leading to high price of car ownership. This can be a **politically unpopular move**.
- The COE displaces the price mechanism. This means that the output level is no longer responsive to changes in its price. In the absence of price signals, the onus lies on the government to predict as best as it can the socially desired level of output. However, the government also **does not have perfect information**. Given these limitations, legislation and regulations such as the COE policy can at best be only partially effective in reducing traffic congestion.

Policy 3: Providing a Quality Public Transport System – Efficient & Affordable

The government aims to provide an attractive public transport system to encourage people not to use their cars for work trips but to travel by public transport. By providing a public transport system that is fast, efficient, comfortable, affordable and convenient, this will help to improve the substitutability between public transport and cars and reduce the demand for cars.

To achieve this, the government has to continue to expand Singapore's rail and bus network system, ensuring greater affordability and reliability, higher travel speed and greater predictability of arrival and departure times for the rail and bus network.

Evaluation of Public Transport Policy

Merits

• Minimise road congestion and pollution

Demerits

- Expensive
- Long time lag between building the infrastructure and realising the fruits of policy

Synthesis

Usage charges and high vehicle ownership controls in Singapore are different ways of correcting the external costs of congestion. Over the years, the emphasis has shifted towards road usage, rather than ownership controls. By intervening in the market, the government has been able to manage traffic congestion via the use of

price signals. In the area of public transport, the Singapore solution is a mix of government funding of infrastructure and provision of public transport services.

4.2 A CLOSER LOOK AT EDUCATION IN SINGAPORE

Why education leads to market failure

Given that market failure occurs in the market for education, many countries around the world subsidise education and the Singapore government is no exception, with several policies targeted towards improving education levels, especially at the basic level.

Policies implemented by the Singapore Government in the Education Sector

Policy 1: Subsidising Education to Achieve Allocative Efficiency and Equity Education in Singapore is heavily subsidised as labour is Singapore's most precious resource given Singapore's lack of natural resources. Singapore's economy is also very knowledge-intensive.

As shown in Figure 21. the equilibrium without government intervention is at point F where MPC = MPB or $D_1 = S_1$. In this case, because of the positive externalities arising, marginal external benefit is added to the MPB curve to give the MSB or marginal social benefit curve.



Figure 21: External benefits and use of subsidies

When the government subsidises the production of education, it reduces the cost of supplying the product. The MPC curve or supply curve shifts downwards by the amount of the subsidy (S₁ shifts down to S₂), which equals MPC minus the subsidy. The marginal cost of supplying the good is reduced by the amount of subsidy and the vertical distance GH is equal to the value of the subsidy provided. Producers will be able to sell output Q₂ at a price of P₃ which is where D₁ curve intersects S₂ curve. The production and consumption level would be socially optimal at OQ₂.

Subsidies also reduce the price of education to the consumers, hence making education more affordable and accessible to the poor, thereby achieving **greater** equity.

The degree of government subsidy differs for different levels and types of education. Primary education is basic and literacy is essential to the function of society and ought to be accessible to all. Secondary education, though having a weaker case for full subsidy, is still instrumental in achieving higher productivity rates, especially with an increasingly sophisticated economy. Higher education, though still viewed as a merit good, has a much weaker case for significant subsidies as the external benefits is not as wide relative to that of private benefits.

Evaluation of Subsidising Education

Subsidies for education (a merit good) have a similar criticism in the difficulty in assessing the amount of subsidies to be awarded due to imperfect knowledge. In addition, the calculation of the marginal external benefits of the different levels of education (primary, secondary and higher education) makes it a contentious issue as to how much subsidies should be provided. This can be witnessed in numerous arguments for and against higher subsidies, especially for higher education.

Policy 2: Direct Provision of Education to Achieve AE & Equity

In Singapore, the government provides primary, secondary and tertiary education directly alongside with the private sector. Most schools are set up by the government and the government is the biggest employer of teachers. The government's role as the dominant education provider allows the government to influence the number of vacancies in each school. Hence by allocating more resources to the production of education, allocative efficiency can be achieved. Direct provision also allows the government to influence the quality and affordability of education in Singapore by setting the benchmark in terms of quality and pricing for the private sector. By ensuring that education is made affordable to all Singaporeans, equity is promoted.

Evaluation of Direct Provision of Education

Education via direct provision has its critics in terms of getting the right balance between the number of schools and teachers available for any year's intake of students. Having the hiring policy of teachers in the hands of the Ministry of Education could mean that there may be periods of shortages (whereby too few resources like teachers are allocated to education from society's point of view) and periods of surpluses (whereby too much resources are allocated to education from society's point of view) if the government is unable to gauge the demand for education accurately due to imperfect information.

Policy 3: Law and Enforcement Policy in Education/Legislation to Achieve AE

Aside from subsidies as a policy tool to increase education levels in Singapore, the government has also used government regulation in the form of the Compulsory Education Act passed in 2003 that makes it compulsory for all Singapore children to receive education till Primary 6. In addition, compulsory education has also been instituted for special needs children from 2019. This has the effect of increasing the demand for education. Hence as more resources are allocated to the production and consumption of education, allocative efficiency can be achieved.

Evaluation of Law and Enforcement Policy in Education

With regards to the Compulsory Education Act, enforcement of the policy may not be an issue in a small, organized country like Singapore but some may argue if there is a better policy to encourage education rather than imposing a law requiring education to Primary 6. Critics have argued that a more conciliatory approach such as getting social workers to counsel troubled families may achieve its aims better.

Synthesis

In conclusion, education is a merit good. Due to consumers having imperfect information about the marginal private benefits arising from education and due to private individuals ignoring the presence of positive externalities in consumption in their pursuit of self-interest, too little resources will be diverted to the consumption and production of education if left to free market forces. Hence, education will be under-consumed and under-produced if left to free market forces. Hence, the government is justified in intervening in the market for education. In addition, these policies aim to promote equitable and fair opportunity to all. The education system in Singapore consists of a mixture of government intervention and market forces. As each policy has its own strengths and limitations, a combination of policies is implemented. The policy of providing subsidies is complemented by other policies such as the Compulsory Education Act as well as direct government provision of the facilities and resources required.

Food for thought:

- Why does the private sector provide education (private good; effective demand)?
- Which is the best government policy for education?

4.3 Examining Healthcare in Singapore

Healthcare services is a merit good because it is deemed to be **desirable from society's point of view** due to two main reasons – (1) **imperfect information** resulting in underestimating their private benefits from consuming healthcare services and (2) the pursuit of self-interests resulting in **positive externalities** in consumption being ignored. Hence, the government deems that healthcare will be under-consumed and under-produced from society's point of view. Too few resources will be allocated to the production and consumption of healthcare services from society's point of view. The government also intervenes in the market on the grounds of **equity**.

Firstly, individuals may not be fully aware of the benefits of seeking early medical intervention for their existing medical conditions. There are also individuals who are not fully aware of the benefits of engaging in preventive healthcare practices such as health screening and vaccination. As a result of imperfect information, consumers underestimate their private benefits from consuming preventive healthcare products like falling sick less frequently and becoming more productive at work and in turn, increasing the probability of gaining a promotion. Hence if left to free market forces, consumers' demand under imperfect information is lower than the demand under perfect information.



According to figure 22, free market equilibrium (under imperfect information) occurs at output OQ_0 . However, the socially optimal level of consumption and production is at output OQ_1 (under perfect information). Hence, under imperfect information, too little resources will be diverted to the consumption and production of healthcare services. A welfare loss represented by area ABC arises from imperfect information as the benefits lost in not consuming Q_0Q_1 units of healthcare services.

There is also a case for government intervention in the market for healthcare services on the grounds of equity. Some individuals will not receive adequate health treatments or will not receive enough of it because they lack the means to do so.

The benefits of **consuming** healthcare services are not confined just to the individual. When an individual obtains a flu vaccination or health screening, there are **external benefits** such as improving productivity and in turn profitability for their employers. Other external benefits include reducing the spread of disease to others. However, given that **consumers ignore these positive externalities due to the pursuit of self-interest**, the marginal social benefits (MSB) is higher than marginal private benefits (MPB).



Figure 23

If left to free market forces, healthcare services are under-consumed from society's point of view. This is because the consumption of healthcare services not only generates private benefits to the consumers like keeping them fit, it also generates positive externalities like reducing the spread of diseases to others and a healthier and more productive workforce benefits employers. Hence, the marginal external benefits (MEB) from consuming healthcare create a divergence between the MSB and MPB curves. However, in the pursuit of self-interests, consumers and producers ignore the positive impact on third parties. According to Figure 23, if left to free market forces, OQ₀ units of healthcare services will be consumed (MPB=MPC). However, the allocative efficient level of output is OQ1 where MSB=MSC. Hence, too little resources are diverted to the production and consumption of healthcare services and a deadweight loss of ABC is incurred as the loss in benefits from not consuming Q_0Q_1 units of healthcare services exceeds the resources saved in not producing Q_0Q_1 units of healthcare services. As the positive externalities generated from the consumption of merit goods like healthcare services are deemed to be significant, there is a need for government to intervene in such markets, like the healthcare industry.

Given that market failure occurs in the market for healthcare services, many countries around the world subsidise healthcare services and the Singapore government is no exception.

Policies implemented by the Singapore Government in the Healthcare Market

Healthcare care can be broadly divided into primary care (includes preventive healthcare and health education) and hospital care. Primary healthcare ailments and treatments are more common and less complicated, and financial outlays are much lower compared to those for hospital care. Hence, primary healthcare in Singapore is left largely to the free market; 80% is provided via unsubsidised private medical clinics and financed by individual out-of-pocket payments or from employment-based benefits.

The situation is, however, reversed in hospital care -80% is provided by the government. As the dominant provider, the government plays a key role in managing healthcare cost in the hospital sector.

Policy 1: Subsidising Healthcare to Achieve Allocative Efficiency and Equity

Government subsidies are given to encourage consumption/production at a level that is closer to social optimum. <u>Subsidies in production</u> reduce the cost of supplying the product. This is shown in Figure 24. The equilibrium without government intervention is at point F where MPC = MPB or $D_1 = S_1$. In this case, because of the positive externalities in consumption, marginal external benefit is added to the MPB curve to give the MSB or marginal social benefit curve. If the government subsidises the production of this product, the supply curve shifts from S₁ to S₂, which equals MPC minus the subsidy. The marginal cost of supplying the good is reduced by the amount of subsidy and the vertical distance GH is equal to the value of the subsidy provided. Producers will be able to sell output Q₂ at a price of P₃ which is where D₁ curve intersects S₂ curve. The socially optimal output level will be achieved at OQ₂.



Subsidies in production include subsidising services at polyclinics. In addition, in public hospitals, class B and C wards are heavily subsidised from 65% to 80%. The Ministry of Health (MOH) also determines which medical services are subsidized – it includes those which are cost-effective, of proven value and excludes those which are medically non-essential or unproven (e.g. cosmetic services, experimental drugs, techniques and technologies whose effectiveness have not been established).

<u>Subsidies in consumption</u> are subsidies given directly to the consumers. This includes Medifund which is set up to cater to those unable to afford healthcare services. Hence, this increases the demand for healthcare services and shifts the demand curve or the MPB curve to the right from D_1 to D_2 until it cuts the S_1 curve at the socially optimal level at OQ_2 (figure 24).

Subsidies also reduce the price of healthcare services to the consumers, hence making it more affordable and accessible to the poor, thereby achieving greater equity.

Evaluation of Subsidies in the Healthcare Sector

- It is difficult to assess the correct amount of subsidies to be awarded due to imperfect knowledge regarding the actual value of the marginal external benefit which is hard to quantify.
- Subsidising healthcare imposes a drain on government's finances. This can pose a serious challenge in view of Singapore's aging population. The spending on healthcare has increased eightfold between year 2000 and year 2015 to reach an estimated S\$9.3 billion. The figure is set to rise to more than S\$13 billion in 2020. World Bank data showed that, in 2013, healthcare spending constituted 4.6 per cent of Singapore's total gross domestic product.
- Providing the same amount of subsidy to all groups of consumers has led to inequity problems (since the rich also receives the same amount of subsidies as the poor) and thus an unnecessary strain on government's finances. Hence, the Singapore government has chosen to provide a more targeted subsidy

policy through the implementation of Means-testing in hospitals and through the introduction of Medifund. Means-testing and Medifund are targeted at providing subsidies to the needy.

Policy 2: Direct Provision of Healthcare to Achieve Allocative Efficiency and Equity

The government's role as the dominant health care provider allows the government to regulate the number of public hospitals, hospital beds and the number of doctors. Direct provision helps to increase the supply of healthcare services and bring it closer to the allocatively efficient level of production and consumption. Direct provision also allows the government to influence the quality and affordability of healthcare in Singapore by setting the benchmark in terms of quality and pricing for the private sector. Affordable healthcare helps to ensure that poor has access to basic healthcare, thereby promoting equity.

The Ministry of Health (MOH) also coordinates and controls the development of specialist disciplines and services and the introduction of high-technology equipment in public hospitals. This prevents unnecessary duplication of costly medical services. By restructuring public hospitals into government-owned non-profit companies which include the Singapore General Hospital (SGH) and Tan Tock Seng Hospital, these hospitals are given greater flexibility over their operation, while imposing discipline on cost-control and seeking out savings and efficiencies. MOH establishes a block budget for each hospital based on its empirical patient workload and case complexity, which incentivizes hospitals to operate as efficiently as possible.

Evaluation of Direct Provision in the Healthcare Sector

Healthcare services via direct provision has its critics in terms of getting the right balance between the number of hospitals, hospital beds and doctors and nurses available due to imperfect information. Having control over the number of hospital beds and the hiring policy of doctors and nurses could mean that there may be periods of shortages and periods of surpluses (hospital beds, doctors and nurses) if the government or Ministry of Health (MOH) is unable to gauge the demand for healthcare services accurately.

Policy 3: Providing Information about the Benefits of Receiving Health Screening and Seeking Early Treatment to Achieve Allocative Efficiency

To reduce market failure arising from imperfect information, the government can provide information about the personal benefits of receiving health screening and seeking early treatment. This can be done through education, advertising and campaigns to influence tastes and preferences. As a result, the demand curve shifts right to DD_1 and the socially optimal output level is achieved at $0Q_1$. Providing more information prevents a welfare cost ABC that arises from imperfect information (Figure 22).

Evaluation of Providing Information

- Time lag mindsets are hard to change;
- Costly;
- Government failure

<u>Synthesis</u>

In conclusion, due to the pursuit of self-interest and imperfect information, too little resources will be diverted to the consumption and production of healthcare services (a merit good) if left to free market forces. Healthcare services will be underconsumed and under-produced if left to free market forces. Hence, the government is justified in intervening in the market for healthcare services. The healthcare system in Singapore consists of a mixture of government intervention and market forces. Pressures on the government to spend more on healthcare services will rise with an ageing population, increasingly affluent lifestyles and advancement in medical technology. Public requests for subsidies to cover the latest medical treatments, the improvement of service quality, and the reduction of waiting times for subsidized specialist consultations are becoming more common. With such pressures, the need to prevent healthcare costs from escalating remains a key challenge. Over the years, various policy changes have been made to improve the existing system. In November 2015, MediShield Life was introduced, which is aimed at helping Singaporeans and Permanent Residents pay for large hospital bills. This is an extension of Medisave (a compulsory savings scheme in the CPF for certain medical treatments) to cover more outpatient treatments and the enhancement of Medishield (a compulsory CPF scheme that go towards the purchase of medical insurance) to improve the payout for larger hospital bills.

In terms of infrastructure spending, under the Healthcare 2020 Masterplan, the government will be adding about 4,100 hospital beds by 2020, including about 1,900 community hospital beds. The ageing population will bring about a greater need to strengthen care in both the intermediate and long-term care and primary care sectors. With this in mind, the government is also accelerating the development of nursing homes with plans to increase nursing home bed capacity from 9,000 in 2011 to 15,600 by 2020.

Although incentives to contain costs and to improve the quality of healthcare services are already in place, future policy amendments will be required as the needs of society evolve. While policies will continue to focus on getting people to stay healthy, healthcare services at the same time need to remain affordable to all. Since prevention is likely to be cheaper than cure, measures like disease prevention and healthy lifestyle promotion should be given due attention.

Food for thought:

- Why does the private sector provide healthcare services (private good; effective demand)?
- Which is the best government policy for healthcare services?
- Do other sources of market failure exist in the market for healthcare?

More information on healthcare schemes in Singapore

Means-testing was introduced in 2009 as "a way to focus limited resources for needy Singaporeans by channelling it to those who need it the most". Hospital wards are divided into 3 classes – A, B and C, with class B2 and C being the most highly subsidised. Means testing is a way to share limited class B2 and C subsidies in a fair manner, by targeting subsidies at the lower-income group. While all patients can still choose their own ward/class, the higher-income patients will receive a lower subsidy if they choose to stay in subsidized class B2 or C wards.

Medifund is set up to cater to the group of patients who are too poor to pay for their medical bills despite government subsidies, Medisave and Medishield. Medifund is a state-established endowment fund and is built up with injections from budget surpluses. Other than hospitalization-related expenses, Medifund can also be used to finance the services of hospices and rehabilitation centres. Medifund thus acts as a safety net for the very poor who may lack Medisave and family support. It is a <u>subsidy in consumption</u>.

Medisave is a compulsory savings scheme where individual's savings are designated solely for the financing of non-primary healthcare services by the individual or by his/ her immediate family members. **Medisave can be classified under legislation.** Since Medisave is actually an individual's own savings, the incentive to economise on healthcare is generally preserved.

Medishield Life is a compulsory national health insurance scheme which replaced the former Medishield scheme with effect from November 1, 2015. This compulsory

all-inclusive health insurance scheme provides lifetime coverage for all Singaporeans and permanent residents, regardless of age or pre-existing health conditions. It is a basic health insurance scheme administered by the Central Provident Fund Board. It helps to pay hospitalisation bills and it is sized for subsidised treatment in public hospitals.

Future Challenges and Developments

While policies will continue to focus on getting people to stay healthy, healthcare services at the same time need to remain affordable to all. Since prevention is likely to be cheaper than cure, measures like disease prevention and healthy lifestyle promotion should be given due attention.

Appendix

Appendix A ASSESSMENT OF THE FREE MARKET ECONOMY (SUMMARY)

			Appendix
 In the labour market, the price mechanism is able to motivate people through its reward-penalty system. In expanding industries, demand for labour increases while in contracting industries, the wage rates of labour in expanding industries fall. Hence, relative wages and salaries provide incentives for labour to move from place to place, and the possibility of losing one's job provides an incentive to work diligently. 	п.	 Merit goods and demerit goods: Merit goods are goods that are deemed to be undesirable from society's point of view. From society's point of view, too little resources are allocated to the production and hence, under-consumption of merit goods while too much resources are allocated to the production and hence, over-consumption of demerit goods. There are two main reasons why a good is classified as such: (ai) Underestimation or overestimation of personal benefits or costs argument due to imperfect information (demand/supply framework) – Theoretical models assume information is perfect. However, in the real world, information is imperfect. Private decision makers may misjudge and therefore underestimate or overestimate their private benefits and private costs arising from the consumption of certain goods and services. For instance, consumers may underestimate the private costs arising from the consumption of demerit goods like cigarettes due to lack of information regarding the negative impact cigarettes have on the health of the consumer. This causes the demand for cigarettes in the absence of perfect information to be higher than the socially desired level (under perfect information). A deadweight loss to society is thus incurred. (aii) A free market responds to the "dollar voles" cast by those with the ability to pay. Resources tend to be allocated mainly to the production of goods demanded by the rich. Thus, the total welfare of the community may not be maximised (e.g. excess production of luxury items and lack of basic necessities). Free market forces have also contributed to the widening income gap between the skilled and the unskilled, the rich and the poor. (b) Externalities argument due to pursuit of self-interest: For example, the consumption of merit goods, such as healthcare and education, generates positive externalities (Refer to the above explanation). Public goods: Public goods are goods that arrotore provide goods (goods that are rivalrous an	

Appendix B

The EU Emissions Trading System

The EU Emissions Trading System (EU ETS) is a cornerstone of the European Union's policy to combat climate change and its key tool for reducing industrial greenhouse gas emissions cost-effectively.

Launched in 2005, The ETS covers some 11,000 power stations and industrial plants in 30 countries (the 27 EU Member States plus Iceland, Liechtenstein and Norway). It covers CO_2 emissions from installations such as power stations, combustion plants, oil refineries and iron and steel works, as well as factories making cement, glass, lime, bricks, ceramics, pulp, paper and board. Between them, the installations currently in the scheme account for almost half of the EU's CO_2 emissions and 40% of its total greenhouse gas emissions.

The EU ETS works on the 'cap and trade' principle. A 'cap', or limit, is set on the total amount of certain greenhouse gases that can be emitted by the factories, power plants and other installations in the system. The cap is reduced over time so that total emissions fall. In 2020, emissions from sectors covered by the EU ETS will be 21% lower than in 2005.

Within the cap, companies receive or buy emission allowances which they can trade with one another as needed. They can also buy limited amounts of international credits from emissionsaving projects around the world. The limit on the total number of allowances available ensures that they have a value. After each year a company must surrender enough allowances to cover all its emissions, otherwise heavy fines are imposed. If a company reduces its emissions, it can keep the spare allowances to cover its future needs or else sell them to another company that is short of allowances. The flexibility that trading brings ensures that emissions are cut where it costs least to do so.

By putting a price on carbon and thereby giving a financial value to each tonne of emissions saved, the EU ETS has placed climate change on the agenda of company boards and their financial departments across Europe. A sufficiently high carbon price also promotes investment in clean, low-carbon technologies. In allowing companies to buy international credits, the EU ETS also acts as a major driver of investment in clean technologies and low-carbon solutions, particularly in developing countries.

Challenges ahead

However, the ETS also faces a challenge in the form of a growing surplus of allowances, largely because of the economic crisis which has depressed emissions more than anticipated. In the short term this surplus risks undermining the orderly functioning of the carbon market; in the longer term it could affect the ability of the EU ETS to meet more demanding emission reduction targets cost-effectively. The Commission has therefore taken the initiative to postpone (or 'back-load') the auctioning of some allowances as an immediate measure, while also launching a debate on structural measures which could provide a sustainable solution to the surplus in the longer term.

Source: Adapted from The European Commission

For more information, refer to <u>http://ec.europa.eu/clima/policies/ets/index_en.htm</u>