



HWA CHONG INSTITUTION
Year Two H1 Economics 2013

- 3 (a) Explain why government intervention is advocated in the markets both for public goods and merit goods. [10]
- (b) There is free wireless connectivity in public areas through Wireless@SG in Singapore. Discuss whether wireless connectivity should be provided free by the government. [15]
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Suggested Outline: part (a)

(i) Explain public goods resulting in complete market failure

A pure public good is a good or a service that has the characteristics of non-excludability and non-rivalry. As such, they will not be provided by the market.

Non-excludable (Free-rider problem)

It is impossible or prohibitively expensive to exclude non-payers from using it.

For instance, once street lighting is provided, there is no inexpensive or practical way to restrict the availability of the service to people who pay.

Non Rivalry (MC=0)

Consumption of the good by additional individuals will not prevent others from enjoying the same good, or reduce the quantity and quality consumed by existing consumers.

Marginal cost of providing the good to the additional user is zero.

For instance, the use of the street lighting by a pedestrian will not reduce the amount of light available to others.

Missing market/ Complete market failure

As a result of the characteristics of non-excludability, the provision of public goods suffers from the “**free-rider**” problem. Since it is not possible to exclude those who do not pay from consuming the good, no self-interest, rational consumer will reveal his effective demand and hence has no incentive to pay what the good really is worth to them.

Since anyone can enjoy all the benefits of a pure public good once it is produced without paying for it, there will be an **absence of price signal** and producers will not supply this good. Hence, despite the fact that a pure public good yields valuable benefits to society, the “free rider” problem means that the **market will not provide such a good**.

As a result of the characteristics of non-rivalry, no self-interest, a rational firm will not be willing to produce the good or service.

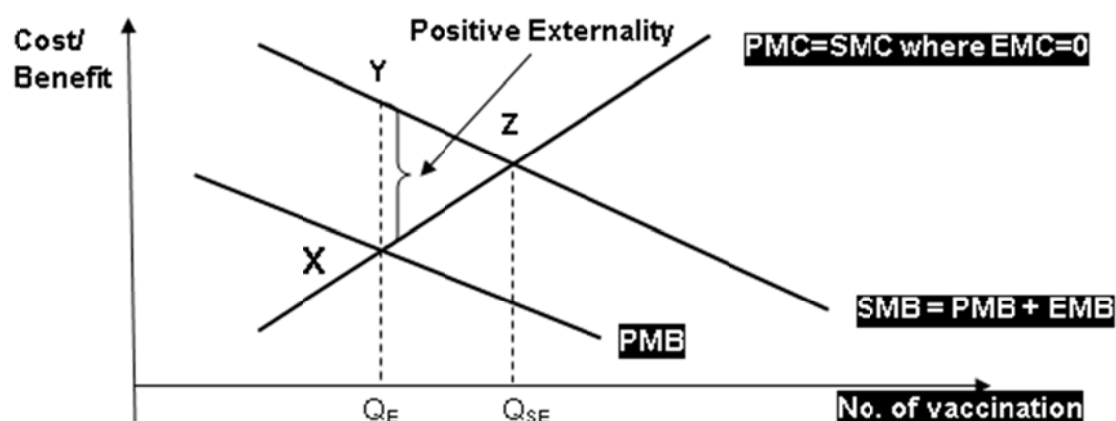
Therefore government intervenes to provide what is socially optimal.

(ii) Explain merit goods resulting in under consumption/ production

MERIT GOODS are goods or services that have been deemed by the government as socially desirable and under-consumed/produced and their desirability is usually due to external benefits spilled over to the society.



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- Assume that this activity only results in positive externality; and not negative externality i.e. $EMC=0$. Thus, $PMC=SMC$.
- In perfectly competitive market, the equilibrium outcome will be at point X of output Q_E where $PMB=PMC$.
- But due to the positive externality, the actual benefit to the society is represented by Social Marginal Benefit (SMB) which takes into account the full benefit to society of the influenza vaccination. SMB lies above PMB, as it includes both PMB and external marginal benefit (EMB). Hence, the allocatively efficient output should be Q_{SE} where $SMC=SMB$ and not Q_E .
- Hence, there is underconsumption of Q_E-Q_{SE} .
- Area $YZQ_{SE}Q_E$ is the incremental social benefit for Q_E-Q_{SE} .
- Area $XZQ_{SE}Q_E$ is the incremental social cost for Q_E-Q_{SE} .
- Area XYZ represents the welfare loss from the underconsumption of $Q_{SE}-Q_E$ because if left to the market i.e. without government intervention, the outcome will be Q_E .

Thus, government intervenes, for instance, by adjusting the price through subsidies, to ensure more resources are allocated to the production of this good, eliminating the deadweight loss.

Level	Mark	Descriptor
L3	7 – 10	Clear analysis/explanation to demonstrate inefficiency leading to market failure and the need for government intervention.
L2	5 – 6	Incomplete analysis to explain for market failure. Answer is lop-sided.
L1	1 – 4	Answer shows some knowledge of the sources of market failure but analysis is inaccurate.



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- (b) There is free wireless connectivity in public areas through Wireless@SG in Singapore. Discuss whether wireless connectivity should be provided free by the government. [15]

Thesis: Yes, it should be provided free

1. MC = 0

Established earlier in part (a) that public good should be provided by the government due to missing market.

Now, consider whether wireless connectivity is a public good and hence whether it should be provided by the government.

Wireless@SG can be made excludable to non-payers. Only registered users can enjoy the free access. If charges need to be imposed, non-payers can be easily excluded.

Wireless@SG seems to be non-rivalrous as access to the network by one user does not mean that an additional user will be excluded in the consumption, i.e. it can support multiple users. Since supply of wireless connectivity is not depleted by an additional user, the MC of serving an additional user is zero.

Therefore, the government should provide for it free and not charge a price so as to achieve allocative efficiency ($P=MC=0$).

However, as more additional users access the network it does slow down the speed of access which means the quality of service is not the same as before. Thus additional user can lead to rivalry in consumption in terms of speed access.

2. Wireless connectivity is a merit good with huge positive externality

The **Private Marginal Cost (PMC)** - The private cost of providing an **additional** user the wireless service by service providers such as M1 and SingTel is the additional cost in providing the service such as wages for hiring more employees to explain to walk-in customers or those who call up and to process paperwork.

The **Private Marginal Benefit (PMB)** The private benefits of providing the service to an **additional** user is the additional revenue to the company.

Social Benefits (private and external benefits)

In the provision of wireless network, it creates positive externality or **External Marginal Benefits (EMB)** to society at large. This positive third party spillover effects include the benefits of increasing efficiency for people to access information and leading to higher productivity. A more technological advanced environment will benefit the employers and the economy.

The price mechanism fails to bring about a socially efficient allocation of resources in this case. This is because the benefit to other parties created is **unpriced** by the price mechanism and therefore is not included in the **private benefits** of providing wireless network. Hence we can say that there is a divergence between the **Social Marginal Benefit (SMB)** and the **PMB**, and as a result **SMB lies above that of PMB. i.e. $SMB = PMB + EMB$** .

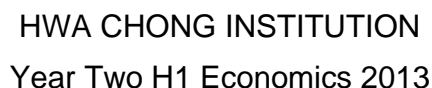
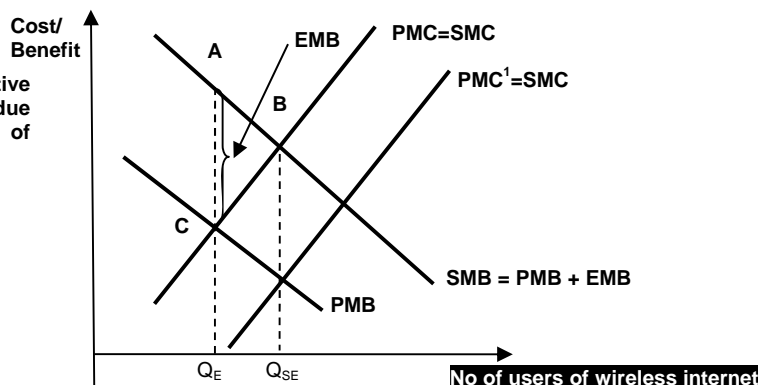


Figure 1: Positive external benefits due to provision of wireless network.



Due to the huge extent of external benefits deemed by the government, it bears the entire cost for the service (BQ_{SE}) to ensure the socially optimal output is achieved.

Subsidizing private operators
Government can consider subsidizing the various operators for the cost of supplying the service, making the service cheaper to the consumers to encourage usage.



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However, subsidies, if given to producers, may breed inefficiency as it reduces the incentive for firms to stay efficient by finding the lowest cost of production. Over time, firms may become complacent and unable to cope with competition if the subsidies are removed.

Educating the users

Government can promote the use of wireless internet through campaigns and spread the message of benefits of internet connectivity.

Complement with cheap computers, laptops and smartphones

Need to ensure that such devices used to access wireless network should be made more cheaply to encourage wider use of wireless internet to reap the full social benefits a more technological advanced and productive workforce.

Conclusion

Whether wireless connectivity should be provided free by the government depends on the extent of its positive externality viewed by the government. If the government views it as significant, then a full subsidy (free) may be justified. However, the extent of external benefit is unlikely to be high, given the fact that there are already many users who have already subscribed to wireless broadband/ data plan and can access wireless network as paid users without any subsidy from the government (infra-marginal externality), providing such services free may not be a well-targeted policy and may lead to a wastage of resources.

Level 3 (9-11)	<ul style="list-style-type: none">• A well-developed answer that gives a reasoned discussion for free provision and considered other alternatives as better solutions.
Level 2 (6-8)	<ul style="list-style-type: none">• Attempt to apply an analytical framework (positive externality diagram) to answer the question but analysis may not be accurate.• Answer may not be balanced
Level 1 (1-5)	<ul style="list-style-type: none">• Show some knowledge on why government should intervene for wireless connectivity, largely descriptive
E2 (3-4)	<ul style="list-style-type: none">• For an evaluative assessment based on sound economic analysis.
E1 (1-2)	<ul style="list-style-type: none">• Evaluation without justification.