

Question 3

- a. Using examples, explain the basis by which rational decisions are being made by consumers and producers. [10]
- b. Assess the economic case for government intervention in the market when externalities are present. [15]

Part a: Using examples, explain the basis by which rational decisions are being made by consumers and producers.

Command – Explain

Content – Basis for decision making for consumers and producers

Context – Open

The fundamental basis of economic decision making is individuals' or organizations' desire to maximize benefits while minimizing costs. This balancing act is referred to as maximizing value, and it is a skill that takes practice to master. For individuals, value maximization decisions may include choosing between name-brand products and generic products, and choosing between small or bulk sizes. For a company, value maximization involves finding the lowest-cost suppliers that meet the company's quality standards, then determining the economic order quantity for each purchase. Economic order quantity is the perfect amount of a product or material to order at a time, taking advantage of quantity discounts while also keeping holding and transportation costs under control.

Explain what is involved in rational decision-making both by consumers and by firms.

All economies face the problem of scarcity, a situation where there are unlimited wants but limited resources. Thus, choices have to be made for the best allocation of resources in an economy. Similarly, consumers and firms also face constraints and thus must also make choices. As opportunity cost is incurred when making choices, societies will choose the particular assortment of goods and services with the objective of gaining the highest level of satisfaction with the least possible cost. Both consumers and firms makes rational decision where they aim to maximise their self-interest. In the case of consumers, utility maximisation while in the case of firms, it is profit maximisation. This can be achieved by weighing up the opportunity cost arising from an activity against the benefits, by considering the marginal effects of change.

Body 1: Marginalist principle applied to consumers in their decision making process

A rational consumer seeks to maximise net total benefits from consuming a good. Rational decision-making by consumers involves considering the marginal benefits and the marginal costs of consuming the good. Consumer will consume when $MPB=MPC$. The marginal benefit is the satisfaction derived from consuming an additional unit of the good while the marginal cost is the price paid for the good. For example, if the plate of wanton mee costs \$3 and \$1 is equivalent to 100 utils, the wanton mee should bring the consumer 300 utils of satisfaction. If a plate of wanton mee brings Tim 400 utils of satisfaction then Tim would deem that the plate of wanton mee is cheap as he pays only \$3 for 400 utils of satisfaction. Tim would then buy that plate of mee. If the 2nd plate brings him 300 utils of satisfaction, then Tim would consume the second plate and stop there as the price he pays is equivalent to the satisfaction he gets from consuming it!

A rational consumer will buy an extra unit of a good as long as marginal benefit (MB) exceeds the price of the good because it increases the level of net total benefits from consumption i.e. consumers will consume up to the point where $MB=P$ where the total net benefits are maximised. Consumers will not

consume the additional unit where MB is less than prices as it lowers the net total benefits from consumption. (Explanation could also be given with reference to the $MPB=MPC$ concepts)

Since rational consumers will buy a product only if the MB exceeds or is at least equal to the price paid for it, it follows that the demand curve in a market represents the MB that consumers derive from consuming an extra unit of the good.

Body 2: Marginalist principle applied to firms in their decision making process

A rational firm seeks to maximise total profits from the production and sale of a good. Rational decision making by firms means that firms will base their output decision on the marginal revenue and marginal cost. In deciding how many units of a good to produce, a profit maximising firm will produce up to the point where the additional cost from producing one additional unit of output equates the additional revenue from selling it.

A rational firm will produce and sell an extra unit of a good as long as $MR > MC$. Because this means that by producing that unit, there will be bigger addition to revenue (MR) than to cost (MC) and total profits will increase given that marginal profit is positive. When production by the firm is at an output where MC exceeds MR, producing that add more to cost than to revenue and hence reduce profit. Firms' profits can be increased by cutting back on production since marginal profit is negative. Firms thus produce up to the point where $MR=MC$ where the total profit is maximised.

In perfect competition, $MR=P$. This means that the firms produce up to the point where $P=MC$. This also means that the firm's supply curve for the good, reflects the MC of the good.

Body 3: Other basis for decision making by the consumer and the producer

Rational consumer and producer decisions could also be made based on the following:

- Gut instincts – some consumers or producers could base their decisions on an experiential or emotional background that may have no theoretical or analytical basis. Decisions made on gut instincts could come about due to refined and improved intuitive instincts drawn from repeated successes and sharpened discernment.
- Alternative objectives – producers may have alternative objectives eg output maximization, revenue maximization, welfare maximization or others and these would govern their decision making maxim upon which they will decide as to how to price their product or decide upon which amount of output they would want to produce.
- Statistical data – some consumers or producers may make decisions based on some statistical data that they may have gathered on their own or through some other means. These data may be random inputs that in and of themselves may hold little value. Validity of such decisions may be flawed depending on the nature of the data collected.
- Information – information is obtained when data is derived from a more complete set of processed facts that would allow for a more thorough analysis and thus better informed decisions that are to be made.
- Knowledge - Knowledge is information that has been refined by analysis. The knowledge has been assimilated, tested and/or validated. Most importantly, it is actionable with a high degree of accuracy as there is proof that the concept exists. Decisions based on knowledge would prove to be more accurate than those based on data or information.

These alternative sources of decision making processes for the consumer or the producer are valid and used by them.

Conclusion

The marginalist principle is adopted by both consumers and firms when they attempt to maximise their self-interest. When resource allocation is left to the price mechanism, goods are produced up to

the point where demand matches supply. Since demand reflects MB and supply reflects MC, at the market equilibrium point, where demand matches supply, MB=MC and society's welfare is maximised.

Level	Descriptor	Marks
L3	A well developed answer that uses the <i>marginalist principle</i> and other indicators to explain how both producers and consumers make their consumption and production decision.	8 – 10
L2	Descriptive answer that recognises the <i>marginalist principle</i> is the basis of rational decision making but there are gaps in explanation.	5 - 7
L1	Presence of some knowledge of the workings in the market.	1 – 4

Part b: Assess the economic case for government intervention in the market when externalities are present.

Command – Assess

Content – Government intervention when externalities are present

Context – An economy

When externalities occur, market failure is present. The cause of markets failing could be due to several factors namely - externalities, imperfect markets, asymmetric information, incomplete markets, indivisibility, imperfect markets among others. Externalities are market imperfections where the market offers no price for service or disservice. These externalities lead to misallocation of resources and cause consumption or production to fall short of Pareto optimality. Externalities could be divided into - negative externalities: under-priced; over-consumption or over-production and positive externalities: over-priced; under-consumption or under-production relative to the social optimum output level.

Body 1: The case for government intervention especially when it is necessary and beneficial especially for negative externalities

- Govt intervention in the presence of negative externalities resulting in a significantly large deadweight loss is to be regained and needed to be done as well as is favourable because it:
 - raises market price and lowers equilibrium quantity in the market
 - leads to efficient resource allocation brings about welfare improvements for both consumers and producers.
- For example: To overcome market failure caused by car usage (negative externality), Singapore's govt adopts the following policies as discussed below:
 1. Electronic Road Pricing (ERP)
 2. Certificates of Entitlement (COEs)
 3. Increased parking charges
 4. Increased fines – traffic and parking fines
 5. Providing an efficient/quality public transport system
- Explain Electronic Road Pricing (ERP) [What is it & How it works]
 - It imposes a price for using a designated road that is over-used (causing congestion)
 - Works like an indirect tax per unit to equate MEC caused by the car journey (tax per unit = MEC).
 - Road users are charged according to the external cost they impose on the rest of the society, such as the congestion, noise and pollution that their journey creates. This forces them to internalise their external costs. When motorists are made to bear the

full cost of their driving, they will then cut down their consumption to the socially optimum level.

- **Illustrate with diagram how a tax is implemented to force consumers to internalize the external costs**

- (i) **Using the Demand – Supply Analysis framework**

- An indirect tax imposed → ↑ cost of car/road usage → effectively reflected as a leftward/upward shift of the supply curve of roads
 - At original price, P_0 , a shortage of road space is created. Drivers who must use the particular road will be willing to pay a higher price for the good while those unwilling to pay for the usage will reduce their quantity demand for it (& look for alternative routes) → ↓ in the number of cars using the now priced road.

- (ii) **Using the Cost-Benefit Analysis framework**

- A tax → ↑ cost of car/road usage generates negative externalities due to over-consumption.
 - The govt can impose a tax = ab per unit of mile driven to internalize the external cost. The size of the tax (ab) should be ideally equivalent to the extent of marginal external cost (MEC) at the socially optimal output so as to completely eliminate the welfare loss.
 - The tax forces the consumers to take into account (internalise) the external costs raising the MPC to be at the same level as the MSC. Faced with the new supply curve, the motorists will reduce consumption to the socially efficient level. The welfare loss to society would be eliminated.

Body 2: The case for government intervention when it is necessary but not beneficial

- (a) Government intervention may fail resulting in greater inefficiencies

- Govt intervention in the market, though may be needed, may not be favourable if government failure is present and worsens the problem instead of improving it.
 - (i) A significantly higher price than the true price or over-taxing leads to an over-priced and under-utilised road and may lead to excessive speeding and an increase in the likelihood of accidents and loss of life.
 - (ii) A marginal increase or new price lower than the ideal/true price or under-taxes may lead to an under-priced road with minimal effects on road usage and congestion.
 - The success of the government, depends on its ability to gauge when, how and to what extent it should intervene. Government actions however may fail or have its limitations. Government failure could happen in the market for motor vehicle usage due to information imperfection:
 - A lack of information about the true value of the negative externality: It is very difficult to price a negative externality such as pollution in monetary terms. It is difficult to measure the costs imposed or to trace the source of the pollution. Hence the government in trying to correct the over-consumption of motor vehicle usage to an efficient level may cause greater deadweight losses instead.
 - The over-estimation of the MEC may lead to excessive tax implementation which may cause MPC to rise to $MPC + tax$, resulting in the consumption of motor vehicles not be equal to the socially optimal level. The associated deadweight loss may lead to a worsening of allocative inefficiency and govt failure is said to have occurred.

- (b) Costs of govt intervention outweighs the deadweight loss to be regained:

- The gain from govt intervention should be weighed against its costs.

- Govt intervention may not be justified if the gain is less than the costs of eg administration or operational costs.
- Govt intervention may not be justified if it leads to consequences that adversely impact the economy, eg, anti-pollution measures may increase the unit COP which may deter FDIs thus affecting potential growth.

Body 3: The case against government intervention especially when it is unnecessary & not beneficial

- When the extent of deadweight loss is not significantly large, though it may result in relative inefficiencies with respect to the social optimum government intervention may not be necessary.
- When the property rights assigned in the market are already established & well-defined, and it allows for the parties involved to work towards a socially optimal outcome at a low negotiation costs. Hence, government involvement may just be to ensure the compliance of legislative statutes.

2. Conclusion

Though presence of externalities cause markets to fail resulting in over-consumption (-production) or under-consumption (-production), governments have many considerations or issues that may be important but may not always be necessary and/or concurrently beneficial. Characteristics of each market is unique and government's intervention, capacity and efficiency in the respective markets may vary. Hence, the relevant regulatory agencies of the government need to exercise wisdom.

L 3	Well-developed explanation of government intervention when externalities are present with adequate use of examples.	8 - 10
L 2	Developed discussion of government intervention for either positive or negative externalities are present with limited use of examples.	5 - 7
L1	Mere listing of the measures that can use to correct the over-consumption (-production) or under-consumption (-production) problem when externalities are present.	1 - 4
E3	Judgment on the issue that is well elaborated of supporting reasons for stand.	4 - 5
E2	Judgment on the issue with adequate elaboration of supporting reasons for stand.	2 - 3
E1	Judgment on the issue without elaboration on the reasons for stand.	1