

ECONOMICS

Higher 2

Syllabus 9570

Examiner's Report

Year 5 Promotion Examination 2025



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Y5 H2 Promotion Examination 2025

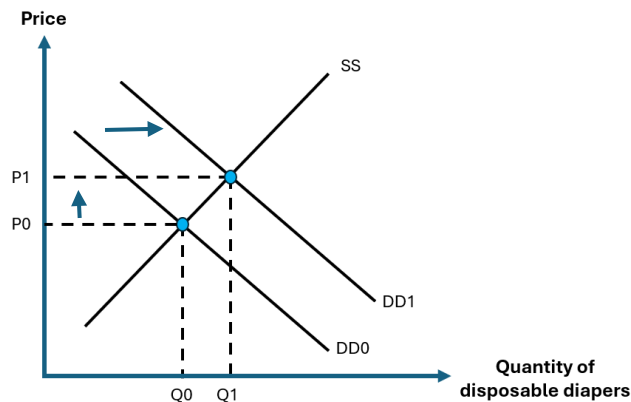
Paper 9570/01
Paper 1

Case Study

- (a) Using a diagram, explain why the price of diapers are expected to rise in the global market. [2]

There is an increase in demand due to **income** (assume diaper is a normal good), **population size or taste/preference**, as seen in “steady rise in the global birth rate” or “increasing number of mothers join the workforce” or “disposable diapers have become essential to working parents” (Extract 1).

This means that Q_{dd} at every price level has increased, which is illustrated as a **rightwards shift in demand curve from DD_0 to DD_1** , as seen in Fig 1 below. This creates a **shortage** at original price P_0 , which exerts an **upwards pressure on prices**. As diaper price rises, Q_{dd} falls and Q_{ss} rises till a new equilibrium is reached where $Q_{dd}=Q_{ss}$ at E_1 . **At the new equilibrium, diaper prices have risen.**



Mark scheme:

1m: Case evidence + Identification/Explanation of non-price DD factor

1m: MAP + Diagram [1m]

Examiners' comments:

- Many students did not obtain the full 2 marks. Students are to note that simply citing case evidence without some explanation and/or identification of a non-price factor of DD is insufficient to answer an “explain why” question, even if the case evidence is seemingly “self-explanatory”.
- In addition, there is a need for a brief market adjustment process to explain how the price increases while referring to the diagram (shortage at OP_0 so price bided up to OP_1).
- Many students did not label the diagram appropriately.

- (b) (i) Calculate the total savings parents can enjoy if they use reusable diapers till their baby is toilet trained. [2]

Total cost of disposables = $\text{US\$}0.3 \times 8 \times 365 \times 2.5 = \text{US\$}2190$

Total savings = $\text{US\$}2190 - \text{US\$}500 = \text{US\$}1690$

Mark scheme:

1m: Calculation of cost savings

1m: Accurate unit used

Examiners' comments:

- *It is important for students to realize that data will be presented in specific units. Data presented in different units can result in very different outcomes for decision makers.*

- (ii) Explain how economic theory suggests that parents act rationally to decide to switch to reusable diapers. [4]

Background context given:

- Disposable diapers: Low upfront cost per unit, but recurring costs accumulate as each additional diaper adds to total expenditure. The marginal cost of each additional use is high (buy another pack).
- Reusable diapers: High upfront cost (buy cloth diapers + washing equipment), but the marginal cost of each additional use is low (just need detergent, water and time to wash). Over time, the average cost per use falls.

Using the marginalist principle, consumers (parents) are assumed to act rationally, meaning they try to maximize utility subject to their budget constraints.

- In deciding between disposable vs. reusable diapers, parents compare the marginal costs (MC) and marginal benefits (MB) of each choice.
- The marginalist principle states that individuals make choices at the margin:
- If $MB > MC$, then increase quantity is rational.
- If $MC > MB$, then decrease quantity is rational.

Weighing the rational switch to reusables

- The marginal benefits of switching to reusable diapers are the cost savings from the switch of disposable diapers to reusable diapers – US\$2190, as seen in (bi), while the marginal costs **of the switch** include the cost of reusable diapers (explicit cost of \$500) AND the implicit costs e.g. inconvenience & time spent washing.
- OR; The marginal benefits of switching to reusable diapers are the cost savings from not using disposable diapers to reusable diapers – US\$1690, as seen in (bi), while the marginal costs **of the switch** include the implicit costs of inconvenience, cost of washing and maintenance.
- Should $MB > MC$, parents will make the rational decision to switch to reusable diapers.

Mark scheme:

1m: Explain what economic theory is used when rational decision making (RDM) is asked.

3m: Identify the marginal costs (MC) and MB. Answer to reflect both explicit and implicit costs and MB of decision with respect to each type of diaper, weighing the switch using RDM

Examiners' comments:

- *Students are expected to use the RDM framework. The key words in the question are: "economic theory...act rationally to decide to switch,,,,,..." These key words are meant to elicit the marginalist principle used in the parents' rational decision-making. As such, students must apply and highlight benefits & costs as MB and MC.*
- *Students who used background information given in the case material to link to MB and MC tended to score better than answers that were purely theoretical.*
- *Some answers did not score well as case evidence was not used. Such answers used their own reasons such MB of both types of diapers are similar. Such responses did not consider why and what determines the valuation of MB and MC.*

- *Flawed responses equate opportunity cost to implicit cost. It is important to note that in Economics, the term “cost” without any qualifications is understood to refer to the value of everything that must be given up to produce or obtain something. Thus, when simply stated as cost, it means opportunity cost.*
- **Opportunity cost = cost = explicit (monetary) cost + implicit (non-monetary) cost.**
- *Most answers failed to respond to the “switch” mentioned in the question accurately. Good responses are expected to make a brief link/statement and conclude on how the parent will make the decision.*

(c) With reference to Table 1, explain whether P&G’s pricing strategy for its Pampers diapers is an example of price discrimination. [4]

- Definition: Price discrimination occurs when a producer sells the same good at different prices whereby the price difference does not reflect differences in the cost of supplying the consumers.
- Singaporean and Indonesian consumers are charged different prices, due to their different price elasticities of demand. As seen from Table 1, the average income of a Singaporean is higher than that of an Indonesian. Singaporean consumers will thus tend to have relatively more price inelastic demand as the cost of diapers is likely to take up a lower proportion of income while Indonesian consumers tend to have relatively more price elastic demand as the cost of diapers takes up higher proportion of income.
- As Singaporean consumers are less price sensitive, P&G will charge a higher price for them while charging a lower price for the more price sensitive Indonesian consumers.
- However, this price difference could be explained by a difference in the costs of the diapers to the retailers (despite selling the same model of diapers) in these two countries such as transport, labour or material costs if the diaper is produced in each country for their domestic market.
- Explain in conclusion whether P&G’s pricing strategy is likely (or not) to be an example of price discrimination based on all that have been discussed.

Mark scheme:

3m: What is price discrimination and explain why Table 1 most probably depicts P&G utilizes price discrimination strategy

1m: Explain why it may not be a price discrimination strategy

Examiners’ comments:

- *Students are expected to explain:*
 - What 3rd degree price discrimination is*
 - How PED is used to segment markets*
 - How prices are thus charged differently*
- *No need for diagram for 3rd degree PD*
- *Inability to prevent arbitrage or resell is NOT acceptable as that is a condition that affects profitability and not what the definition of PD is on.*
- *To be more accurate, firms are not increasing the price for less price sensitive consumers. Rather, they are charging the full price or relatively higher price to these consumers.*
 - *It is more accurate to explain that the demand for diapers in Indonesia is relatively more price elastic than SG as **spending** on diapers take up a bigger portion of their income instead of **price** on diapers taking up a bigger portion of their income as the factor affecting PED is wrt proportion of income spent on the good.*
 - *Weaker students argued that the demand for diapers is relatively more price inelastic in SG due to the higher average income in SG. This is inaccurate as factor affecting PED is % of income spent on a good and not level of income.*

- (d) In light of increasing competition from new brands in the baby diaper market, assess whether P&G should further its brand investment to increase its profits. [8]

General Approach:

1. Explain impact of increasing competition on P&G ($\downarrow$ profits)
2. Assess impacts of furthering brand investment
 - Thesis: Brand investment can increase profits
 - Antithesis: Brand investments may not work and TC increase, TR increase less, so profits may fall or only increase profits to a limited extent

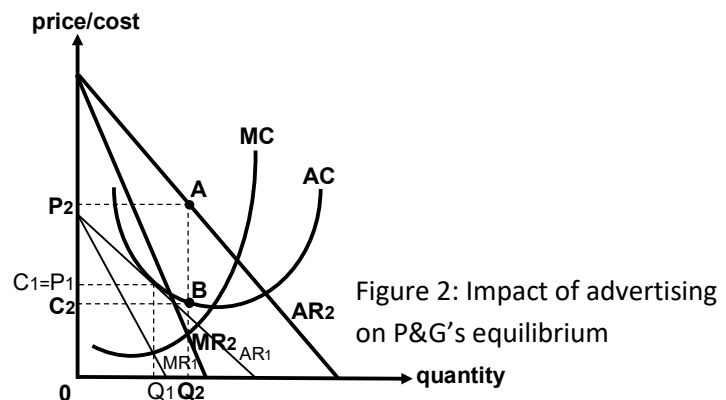
Intro

- Brief explanation of negative impact of increased competition on P&G. Increase in DD for newer firms' goods which will lead to a fall in price and quantity of P&G's diapers, thus reducing its TR and profits if TC is constant.
- Brand investment including packaging, advertising and retail execution can help to counter the fall in profits
- Profits = TR - TC

Body

Thesis: Brand investment may help to increase profits

- Packaging (Extract 3) helps to attract consumers, e.g. using colorful and enticing visuals to make their diapers more appealing, resulting in favorable change in taste and preferences towards P&G diapers. This leads to an increase in DD for P&G's diapers and will lead to an increase in price, quantity and thus TR and profits if TC is constant.
- Retail execution (Extract 3) efforts may also help P&G reach a larger consumer base and attract new, younger, digital savvy consumers (who may not have considered P&G's diapers previously) to P&G's stores (attractive physical or online stores) and buy. This is especially important now as the newer brands have already penetrated the market and captured some of P&G's customers (Extract 2). This will contribute to an increase in DD for P&G's diapers, which will boost TR and profits, assume TC constant.
- Advertising that promotes superiority of P&G's brand (Extract 3) is also a form of product differentiation which can reduce the substitutability of P&G's diapers. Advertisements, printed or online, can inform parents of the benefits of using P&G diapers. P&G can position itself and convince consumers it is also a "direct-to-consumer" brand that is superior to other poorer alternatives and will cater to the newer, younger parents who demand high performing products (Extract 2). Advertisements can also tap into consumers' salience bias as the ads can focus only on what current parents consider to be "unique options that fit their lifestyle". This will result in an increase in DD and make the demand relatively more price inelastic. P&G can then charge higher prices without worrying about the adverse impact on its TR and profits.
- With a higher DD that is relatively more inelastic, there will be a shift in AR/MR and a new profit maximizing price and output equilibrium occurs with higher profit level.



- Based on Figure 2, and applying the marginalist principle, the original profit maximizing price and output is given by $MR_1 = MC$. P&G was originally making normal profits at output = OQ_1 , where $P_1 = C_1$. This is a possible assumption because the entry of new firms has eroded its supernormal profits.
- With successful brand investment efforts that alter consumers' demand, AR_1 shifted to AR_2 . At the new profit-max output level OQ_2 , price is now higher at OP_2 while average costs fall to OC_2 . Therefore, P&G would be expected to make supernormal profits indicated by Area P_2ABC_2 .

Antithesis: Impact of brand investments on profits may be limited or even negative

- There is no guarantee of success when it comes to brand investment as the market is very competitive with new firms offering good quality diapers that seem to cater to changing consumer preferences. In such a scenario, the rise in demand may be limited.
- P&G expects to incur a cost of \$140m in advertising costs (Extract 2), which would reduce its profits since profit is total revenue minus total costs. If the costs of advertising outweigh the increase in revenue it brings about, profits might even fall.
- Furthermore, P&G may suffer from the cognitive bias of sunk cost fallacy, where it is reluctant to abandon its brand investment strategy because of its heavy investment in it, even though the cost of the strategy outweighs its benefits, in a time when they are faced with declining sales.

Conclusion/Evaluation

- Considering the fall in sales for P&G reported in Extract 2, P&G's position as a dominant player is threatened. With changing customers' preferences towards better comfort, environmentally friendly diapers, it is more likely that P&G's brand investment may lead to muted response from parents and worsen losses as rise in TR will be less than cost.
- Thus, P&G's primary strategy should be investing in real product differentiation through product innovation, such that their products will also meet current consumer's needs in terms of producing hypo-allergic, plant-based diaper options that fit their lifestyle. They can then invest in secondary strategies like marketing and advertising their brand new and improved diapers to increase their reach in the market.
- Alternatively, P&G can adopt process innovation to cut costs and lower its price so that it can compete on "affordability" and appeal to those customers that go for "budget-friendly" brands.

Mark Scheme:

Knowledge, Application, Understanding, Analysis		
L1	- Smattering of points not directly linked to question - Weak theoretical framework and/or glaring conceptual errors - No reference to economic concepts or yardsticks related to consumers' welfare - Limited development of analysis - One-sided analysis	1 – 3
L2	- Analysis displays scope with regards to how profits will be affected - Note: Answer should analyze the effects on profits - Balanced answer that demonstrates the ability to consider both the positive and negative impact of brand investment on profits - Analysis should demonstrate depth in being able to make good use of economic concepts and/or tools of analysis – how changes to AR and accurate diagram linking to profits - Analysis should be clear throughout - Good use of case evidence to develop and to support analysis	4 – 6

Evaluation		
E1	Judgement given, with an attempt to substantiate but insufficient Note: No marks for an unexplained conclusion /judgment or mere repetition of points discussed	1
E2	Judgment/conclusion given, soundly and sufficiently supported by reasons / economic analysis Judgment to include recommendation/considerations Good consideration of the given context	2

Examiners' Comments

- *Students need to make better use of case evidence. For example, most students simply reproduced Extract 3 on what is brand investment. Few students use Extract 2 to illustrate how at least one of the strategies under brand investment will address why newer brands are successful in capturing market share from P&G and how the brand investment will help P&G to focus on what the customers are looking for. It is not sufficient to just quote and state that these measures will increase demand and reduce the substitutability of P&G's goods.*
- *Many students have good textbook knowledge of how an increase in demand will impact a firm's profits. It is heartening to see that students could draw diagrams showing the effects of a rise in DD on price and profits under timed conditions.*
- *However, some students still used their precious time to produce poorly drawn diagrams that did not add much value to the answer as they were either too small to depict profit boxes accurately or did not depict AC to link to profits and answer the question. Weak answers used the incorrect market framework of dd and ss for this question.*
- *There were a few weak answers that went into a whole theoretical discussion of the benefits and costs of increasing output and reaping economies of scale without attempting to answer the question.*
- *For evaluation, answers should always be focused on the thesis and anti-thesis with respect to the question (in this case, provide justification why brand investment will or will not be successful to increase profits) before suggesting or recommending alternative strategies to increase profits.*

- (e) Explain why the use of disposable diapers leads to market failure and discuss whether taxing disposable diapers is an appropriate policy to correct it. [10]

General Approach:

1. Explain market failure – negative externality on consumption side
2. Assess effectiveness of taxes
 - Thesis: Tax is effective in correcting market failure
 - Anti-thesis: Tax may not be effective or desirable in correcting market failure
 - Evaluation: Judgement

Intro

- Negative consumption externality leads to market failure in the disposable diapers market.
- To determine whether taxing disposable diapers is an appropriate policy, we can look at its effectiveness, feasibility and desirability in addressing the market failure.

Body: Part 1

Explain market failure due to the negative externality from consumption: over-consumption and overallocation of resources in the market for disposable diapers. This is because the disposable diapers market failed to consider the external costs incurred by 3rd parties.

- Consumers of disposable diapers dump used diapers indiscriminately. Loss of marine life held dear by nature lovers (third parties) due to water pollution OR People (third parties) who live around the incinerator inhaling polluted and toxic air OR Fishermen (third parties) who suffer from lower harvest due to plastic pollution in waters. MEC>0 or MEB. Due to

this externality, there is a divergence between MPB and MSB as MPB is higher than MSB due to the external cost or negative external benefits

- These 3rd parties bear the external or spillover costs and are not compensated by the polluter. The 3rd parties cannot claim compensation for the harm and cost they incurred because they are not part of the market transaction between buyers and sellers of diapers. They didn't agree to the transaction and can't directly demand compensation. Left to free market forces, self-interested and utility-maximizing consumers will consider only their MPB (convenience of using an extra diaper) and profit-maximizing firms will only consider their MPC (cost of factors needed to produce an additional diaper) and the free market price will not reflect this external cost.
- Free market outcome will be where $MPB = MPC$ which means OQ_e units of disposable diapers will be produced and consumed.
- To maximize social welfare, the socially optimal level of production and consumption is at OQ_s units where $MSB = MSC$.
- The additional social benefit derived from consuming $Q_e Q_s$ units is $Q_e C B Q_s$ and this is less than the additional social costs which is $Q_e C A Q_s$ incurred from producing $Q_e Q_s$ units, leading to a DWL of area ABC.
- The overconsumption of disposable diapers thus led to allocative inefficiency and the market fails to allocate resources to produce the "right" quantity of diapers wanted by society to maximise its welfare.

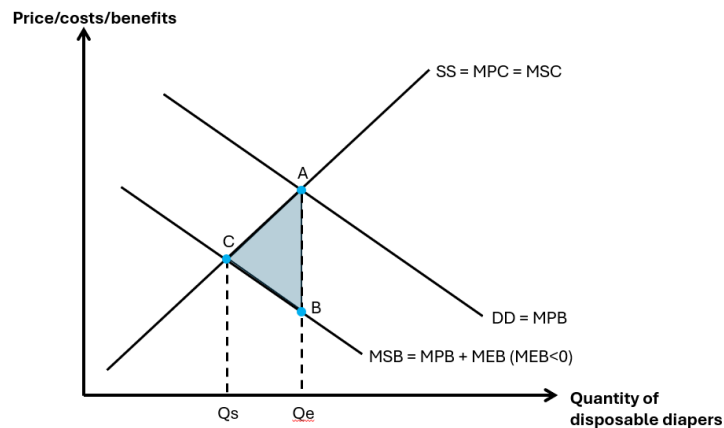


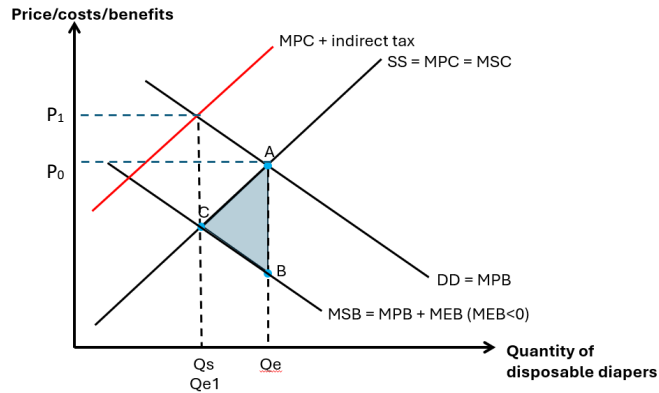
Figure 3: Negative consumption externality in disposable diaper market

Note: It is acceptable to depict the externality on the production side i.e. divergence between MPC and MSC if the student explains the external cost arising from the production side.

Body: Part 2

Thesis: Tax is appropriate in correcting market failure

- Effective: The government can implement an indirect tax on the producers, in order to deter consumption. When a specific tax – equivalent to $-MEB/+MEC$ at Q_s – is imposed on the producers, it increases the marginal costs of production.
- As such, MPC shifts leftward to $(MPC + \text{indirect tax})$. By the price adjustment process, market price rises to P_{e1} where the indirect tax is passed down to consumers in the form of higher price. A new private market equilibrium Q_{e1} is established at $MPB = (MPC + \text{indirect tax})$, which now coincides with the socially optimal output level Q_s .
- DWL incurred is eliminated, social welfare is maximized and allocative efficient outcome is achieved.
- Desirable: Tax is desirable as tax revenue collected can be used to further improve facilities for waste disposal in the country.



Note: No need for a separate diagram. Students can draw on the previous one used to explain market failure.

Anti-Thesis: Tax may not be effective nor desirable in correcting market failure

- [Ineffective] It is difficult to ascertain an accurate monetary value of negative externalities i.e. -MEB at Q_s due to imperfect information on the government's side. For instance, it is difficult to determine if the third-party effects (microplastics in food/water resulting in lower harvest) are truly due to disposable diapers. It is possible that plastic pollution is due to failures in other markets such as the plastic bottle market. This inaccurate valuation of -MEB can lead to over or under-taxation, resulting in under or over-consumption respectively. This limits the effectiveness of taxation as DWL still exists though likely to be to a smaller extent.

Note: Students need **not** show the above on the graph.

- [Undesirable] Taxes are regressive and hence inequitable and undesirable. Imposing a specific tax which raises the market price of diapers (from P_0 to P_1) affects the lower-income families more as diapers will now take up a disproportionately larger proportion of the spending of the lower-income family, compared to that of higher income (given that they consume the same amount of diapers). This adds to the financial burden of these lower-income families and reduces accessibility to diapers which are necessities, leading to concerns of inequity.

Evaluation – Judgement

Students should mention at least one other yardstick of appropriateness (feasibility, effectiveness, desirability or sustainability) in his/her evaluation portion.

- [Feasibility] Diapers are essential goods for infants, and consumers (parents) have no choice but to purchase them. As such, the feasibility of taxing diapers also depends on whether alternatives such as reusables are made available, affordable and suitable for the consumers. For e.g. in rural areas, water may not be as accessible, reusables are not a feasible choice, necessitating use of disposable diapers despite the tax.
- [Recommendation] Effectiveness of diaper tax can be boosted by subsidizing reusables, encouraging a switch to cheaper reusable alternatives, given CED is negative and large.
- [Recommendation] Govt can provide targeted relief to lower-income families who are impacted the most, such as cash vouchers to buy reusables. This effectively reduces demand and promotes equity at the same time.

Examiners' Comments:

- *A strong answer must discuss at least 2 yardsticks (feasibility, effectiveness, desirability or sustainability) to answer the key word "appropriate". Analysis of thesis and anti-thesis*

can be focused on effective, but at least another yardstick must be elaborated on in the evaluation portion.

- It is necessary to illustrate and make explicit the concept of a 3rd party to explain the externality concept. It is insufficient and inaccurate to state that the “external cost to society is the harm the diaper waste does to the environment” or the toxic found in the “stomach of fish in riverways”. For a well explained concept on the 3rd party, make clear that he is a rational decision maker not consulted or directly involved in the transaction. He suffers e.g. fall sick due to ingesting discarded plastic from diapers and needs to be treated at the hospital, incurs costs and will not be compensated by either the buyer or seller of diapers because there is no market mechanism for affected individuals to demand compensation. The 3rd party is NOT the environment or the fish that were killed by the polluted water.
- Weaker students showed confusion between market failure caused by existence of externality and that of information failure. Externality is due to self-interested buyers or sellers who just want to maximize their satisfaction or profits and ignore the fact that their actions will harm others. That is, they do not care about harming 3rd parties. It is not about them not being aware that they are polluting and causing harm to others. Imperfect information, on the other hand, focuses on individual buyers not aware that they are making a sub-optimal decision in the eyes of society, That is, they do not know that they are making the “wrong” decision from society’s point of view because they are not aware of it.
- Students are to note that a tax on diapers should be illustrated as an indirect tax on goods and indirect tax falls on firms first. So, a correct illustration will be to shift the supply curve (MPC curve) instead of the demand curve (MPB curve). There is a shift to the left of the supply curve as the cost of production will now be higher to sellers. So, at every prevailing price, a lower quantity is supplied. It is not feasible to implement a direct tax to shift the demand curve.
- Some students felt the need to explain negative externalities as well as imperfect information causing the market to fail. These answers typically do not provide a comprehensive answer to the latter part of the question which is how the tax on diapers will work and the inappropriateness of it.

Mark Scheme:

	Knowledge, Application, Understanding and Analysis	
L1	▪ Descriptive and journalistic writing ▪ No theoretical framework / inappropriate theoretical framework i.e. did not use market failure framework but used dd/ss instead ▪ Answer mostly irrelevant or inaccurate/ smattering of points ▪ One-sided argument – only why there is a case for intervention and no government taxation to intervene	1-3
L2	▪ Relevant market failure framework and government taxation ▪ Balanced response i.e. with T and AT [1 T and 1 AT suffice] ▪ T linked to a detailed explanation of market failure and how taxation will be appropriate to tackle the negative externalities ▪ AT linked to a well-developed argument in terms of either ineffectiveness of government taxation ▪ Showed depth of analysis: example of negative externality should be explained (i.e.. third-party cost elaborated) ▪ Application of case evidence throughout answer	4-7
E1	▪ Evaluation not well reasoned or irrelevant to the question or lacking an overall judgement. ▪ Vague/ unsubstantiated judgement	1

E2	- Well-reasoned evaluation based on main arguments leading to a judgement. - Judgement well-substantiated with reference to case evidence - Recommendation of another better or possible policy	2-3
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Paper 2: Essay Questions

1. Rice is a staple food in India, essential to the daily diet of millions across the nation. Rising fertilizer costs and inefficiencies in irrigation systems have strained rice yields. Meanwhile, rising prices of wheat, another widely consumed staple, have put further pressure on price of rice, prompting calls for government intervention to ensure continued access to affordable rice.

Source: Adapted from The Times of India, 8 August 2025

a) Explain how demand and supply factors are likely to affect the market for rice in India. [10m]

Part (a)

Guiding Questions to interpret the requirements of the question

- For each requirement, what is the relevant elasticity that can be used to improve the rigour of analysis?
- What diagram should be used for each requirement?
- Is there a need for me to conclude with the outcome on price, quantity and total revenue/total expenditure, given that there is a simultaneous rise in demand and fall in supply of rice in India?

Introduction

Clarify key terms

- Effects on market: Price, Quantity and Total Revenue/ Total Expenditure (Price x Quantity).
- Supply factors: Rising fertilizer costs or inefficiencies in irrigation systems have strained rice yields, increasing production costs - both leading to a fall in supply.
- Demand factors: Rise in the price of wheat, a substitute for rice, increases demand for rice as consumers switch to the relatively cheaper staple.

Body

R1: Explain how rising fertilizer costs and/or inefficiencies in irrigation systems affect supply + PED<1 to explain impact on price, quantity of rice and total revenue for rice producers.

▪ Rising fertilizer costs

Fertilizers are a key factor input in rice farming, used to boost yields and enhance productivity. An increase in fertilizer price raises the cost of production for rice farmers, reducing profitability at each price level. As a result, farmers' willingness and ability to produce rice decline, leading to a decrease in supply of rice.

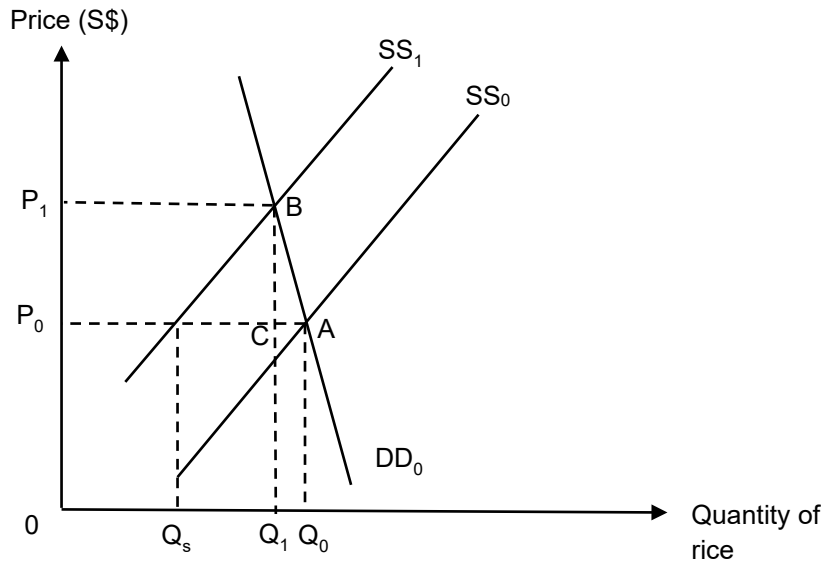
OR

▪ Inefficiencies in irrigation systems

Rice cultivation is highly water-intensive, making efficient irrigation essential for producing healthy yields. Inefficient irrigation systems result in lower productivity per unit of input. This raises the overall cost of production, reducing profitability and hence farmers' willingness and ability to produce rice and leading to a fall in supply of rice.

Analysis (Market Adjustment Process) with reference to diagram drawn

- The fall in supply is reflected by the leftward shift of the SS curve from SS_0 to SS_1 .
- At the original price P_0 , there is a shortage of Q_0Q_s as quantity demanded (Q_0) exceeds the new quantity supplied (Q_s).
- This will cause an upward pressure on the price of rice as the consumers compete for the limited supply of rice.
- As price increases, Q_d will fall due to the income effect (real income and thus purchasing power falls, causing households to reduce consumption of rice) and substitution effect (some households may switch to alternative staples such as wheat, noodles, or bread). At the same time, Q_s will start to increase as higher prices raise profitability for farmers.
- This adjustment process will continue until the shortage is cleared at the higher equilibrium price, P_1 , and lower equilibrium quantity, Q_1 .

**Figure 1: Market for Rice****Explain impact on total revenue with PED application**

The demand for rice in India is price inelastic ($PED < 1$) because there are few close substitutes available for rice, expenditure on rice accounts for a relatively small proportion of household total expenditure, and rice is habitually consumed as part of the daily diet of the locals in India.

With $PED < 1$, total revenue (Price $\times$ Quantity) for rice producers increases from OP_0AQ_0 to OP_1BQ_1 .

Explain why TR rises when $PED < 1$

Rise in the price of rice results in a less than proportionate fall in quantity demanded of rice, ceteris paribus. Thus, the rise in total revenue from the rise in price (P_0P_1BC) outweighs the fall in total revenue from the fall in quantity (Q_1CAQ_0).

R2: Explain how rise in price of wheat affects demand + $CED > 0$ to explain impact on price, quantity of rice and total revenue for rice producers.Rising price of wheat

Wheat and rice are substitutes, as stated in the preamble that wheat is also commonly consumed as a staple. Thus, the relationship between both goods are indicated by a positive CED ($CED > 0$). When the price of wheat rises, quantity demanded for wheat decreases. Consequently, consumers switch to rice

(which is a substitute for wheat) which is now relatively cheaper, leading to an increase in the demand for rice.

Explanation of positive and large CED value

Rice and wheat are likely to be strong substitutes as both serve similar functions as staple carbohydrate sources in consumers' diets. Hence, the rise in wheat's price will cause a large/significant rise in demand for rice and hence reflected by a large rightward shift of the demand curve for rice as consumers are more willing or able to switch to rice without significantly changing their consumption habits or nutritional intake.

*Note: Students may explain rice and wheat as weak substitutes with valid justification.

Analysis of how the large rise in demand for rice affects price, quantity and total revenue:

The increase in DD for rice is reflected as a large rightward shift of the DD curve from DD_0 to DD_1 as shown in Figure 2.

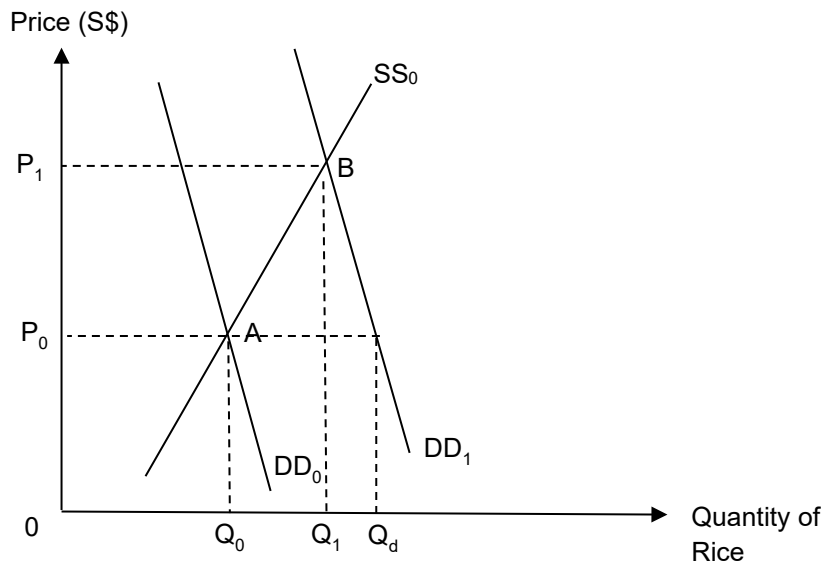


Figure 2: Market for Rice

At the original price P_0 , there is a shortage where the new quantity demanded (Q_d) exceeds the quantity supplied at Q_0 . The shortage will lead to a rise in equilibrium price from P_0 to P_1 and a rise in equilibrium quantity from Q_0 to Q_1 .

Explain the extent of the impact on rise in price and quantity of rice to highlight the application of CED

This leads to a large increase in price to P_1 and quantity to Q_1 , contributing to a large rise in total revenue for rice producers from $0P_0AQ_0$ to $0P_1BQ_1$.

Conclusion: Combination of both demand increase and fall in supply

In the rice market, where PED for rice is inelastic, a fall in supply will lead to an increase in total revenue. At the same time, a rise in demand, given that the CED for rice/wheat is positive will further increase total revenue. Hence, both the demand and supply factors reinforce each other to raise total revenue in the rice market.

Mark Scheme:

Knowledge, Application, Understanding, Analysis		
L1	- Answer is irrelevant in analysis or/ and contains little economic analysis. A few relevant statements that are stated briefly/ superficially. - Contains fundamental conceptual errors in analysis. - Poor understanding of concepts of demand and supply and unclear link to determinants.	1 – 4
L2	- Generally sound analysis with some gaps in theory explained, or limited application to the context of rice. - Lack of scope of explanation: only R1 or R2 explained, or/ and partial analysis of events on rice market e.g. did not address the extent/ magnitude of change in price vs quantity or impact on total revenue. - Attempts to apply elasticity concepts e.g. PED, CED, but lack adequate analysis. - Diagrams are not well-labelled or not well-explained. - Insufficient depth of elaboration e.g. price-mechanism not elaborated, factors affecting demand and supply not explained.	5 - 7
L3	- Good scope and well-developed analysis on how the events lead to an increase in total revenue, and good application to the context of rice. - Both DD-SS factors are well analysed: -R1: $SS + PED < 1$ (to explain impact on price, quantity, and TR) -R2: $DD + CED > 0$ (to explain impact on price, quantity, and TR) - Consideration of simultaneous effect of DD, SS factors on final effect in the rice market. - Good application of the relevant elasticity concepts; PED, CED to explain the increase in TR. - Well-illustrated and well-explained diagrams. - Market adjustment process well explained	8 - 10

Examiners' Comments:

- Students generally demonstrated understanding of the two key requirements and recognized the need to use elasticity concepts to explain the impact on price, quantity and total revenue in the rice market. Most students were able to describe the market adjustment process clearly, with well-developed explanations of how consumers and producers respond to the shortage created.
- Depth of analysis: While most students identified the 2 requirements - rising cost reduce the supply of rice and higher wheat prices increase demand for rice, several students did not clearly establish the links between these events to the resulting shifts in demand and/ or supply changed. For example, only a handful of students explained how higher fertilizer prices raise cost of production given that fertilizers are a key input, and why this leads to lower profitability thereby decreasing supply.
- Use of Economic framework – Students are expected to use a DD/SS framework to analyse the changes in supply and demand on price, quantity, and total revenue. However, many scripts stopped at impact on price increasing, without analysing how the change in equilibrium price and quantity affects total revenue (TR) in the rice market. Some stated TR increases but without any explanation.
- Diagrams: Some students did not label the context (rice market) on their diagrams. Also, when referring to the diagram, students should explicitly link the shifts in the curves and the corresponding changes in equilibrium P_x & Q_{ty} to their analysis.
- Application of elasticity concepts: Several students mapped the PED/ PES determinants to the wrong elasticities, showing weak application of elasticity concepts. Students are to note that there is a need to apply CED to explain why changes in the wheat market (a substitute) will increase demand for rice, according to their CED value. Magnitude of CED indicating and explaining the strength of substitute and the extent of shift in the demand for rice curve should be explained. PED should also be used to

analyze SS changes and its impact on TR. Several scripts showed that PED and PES determinants were mixed up, indicating weak conceptual understanding.

b) Discuss whether subsidies are the most effective government policy to improve consumers welfare in the rice market. [15m]

Clarify key requirements of question

- Which type of subsidies should I choose? Direct to consumers or indirect to producers?
- What is the yardstick for consumers welfare?
- Why does government want to improve consumer welfare? What has happened based on part (a)?
- What skill am I supposed to show to address this phrase “most effective”? This implies explicit comparison of subsidies I have selected with another policy. Where should this comparison appear in my essay structure?
- What does “effective” mean in this question? What outcome should I be focusing on when I am writing my analysis?

Introduction

The rising price of rice has made this staple food unaffordable and less accessible, particularly for low-income households that spend a larger share of their income on necessities. To address this issue, the government can intervene in the rice market through policies such as subsidies or price ceilings with the aim of improving consumer welfare.

Consumer welfare can be assessed using several benchmarks: affordability (market price of rice), accessibility (quantity available to consumers), and gains in consumer surplus.

Relevant policy measures include subsidies and price ceilings. The effectiveness of any policy depends on its ability to achieve these intended aims of lowering rice prices, increasing quantity available, and ultimately raising consumer welfare.

R1: Indirect subsidies

Thesis: Indirect subsidies to rice producers can be effective in increasing consumer welfare

The Indian government can provide indirect subsidies to rice producers, such as input subsidies for fertilizers and pesticides or support for irrigation, to reduce the rising cost of rice production. The government may reimburse farmers for part of their fertilizers or pesticides expenses.

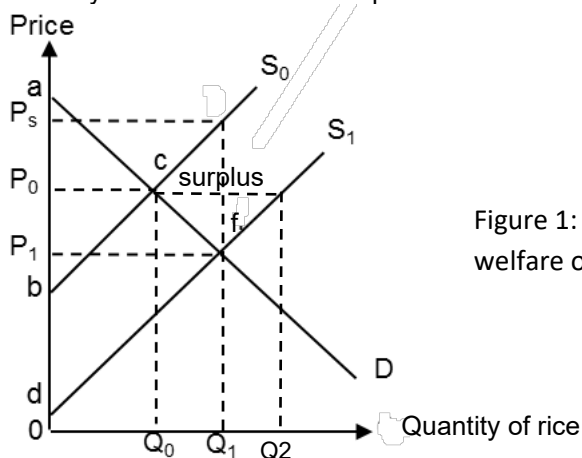


Figure 1: Effect on indirect subsidy on welfare of rice consumers

With indirect subsidy in place, rice production becomes more profitable, making producers more willing and able to supply rice. This shifts the supply curve rightward from S_0 to S_1 .

At the initial price P_0 , the increase in supply creates a surplus of rice of $Q_0 - Q_2$, which exerts downward pressure on price. The market equilibrium price falls from P_0 to P_1 , increasing consumers' purchasing power and real income, making rice more affordable for consumers. The higher quantity from Q_0 to Q_1 also means that there is greater accessibility of rice to consumers since more consumers can have access to rice or consumers can buy more rice. This is particularly so for low-income households that rely heavily on this staple food and spend a larger proportion of their income on rice. Hence consumer welfare rises in the rice market.

Consumer Surplus: This rise in consumer welfare can also be seen from the rise in consumer surplus from Area P_0ac to Area P_1af . The gain in surplus, represented by Area P_1P_0cf , reflects that consumers now pay a lower price while consuming more rice. The difference between what consumers are willing and able to pay and the actual price (which is lower now) paid increases, and the quantity consumed has increased from Q_0 to Q_1 , thereby improving overall consumer welfare.

Anti-Thesis: Limitations of indirect subsidies in increasing consumer welfare

The effectiveness of subsidies in improving consumer welfare depends heavily on their scale. If subsidies given are too small relative to the magnitude of rising fertilizer costs or irrigation inefficiencies, the reduction in production costs will be minimal. As a result, the fall in market price of rice is negligible, and affordability for households remains largely unchanged. This not only undermines consumer welfare but also raises questions about the efficiency of public spending, as scarce government resources may be allocated without producing meaningful improvements in access to rice.

OR

The effectiveness of indirect subsidies in improving consumer welfare is also limited by availability of arable land. The subsidy does not generate a significant increase in supply if there is no suitable land available for growing rice. This means that consumer welfare may not improve significantly, with limited improvement in affordability and accessibility to rice, reducing the overall effectiveness of the subsidy.

R1-EV: Evaluation of effectiveness of indirect subsidies in raising consumer welfare

In the short run, indirect subsidies can directly increase consumer surplus (CS) by lowering expenditure per unit of rice. However, in the long run, prolonged reliance on input subsidies can create dependency and inefficiency among farmers. Farmers may have weaker incentives to adopt more sustainable practices, such as organic soil management or water-efficient technologies, limiting the extent of long-term improvements in productivity and affordability. Moreover, once subsidies are withdrawn due to budget constraints, rice prices may rebound sharply, eroding consumer welfare gains and potentially leaving low-income households worse off than before. Hence, while such subsidies may provide short-term relief, they risk failing to deliver lasting improvements in consumer welfare.

OR (Students may also use direct subsidies as a policy)

R1-Thesis: Direct subsidies to consumers in form of cash vouchers etc

Alternatively, the government may provide direct subsidies to consumers, such as cash transfers or rice purchase vouchers for households in India, particularly targeting low-income groups. Such measure directly lowers the out-of-pocket payment by consumers and raises their purchasing power, thereby increasing both their willingness and ability to buy rice. This leads to an increase in effective demand for rice from D_0 to D_1 .

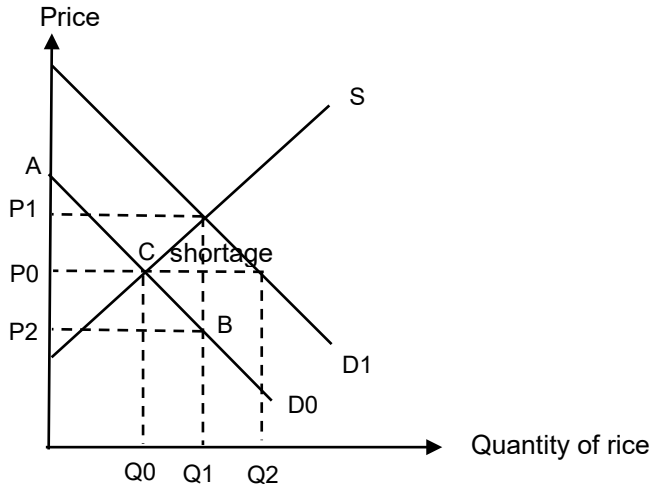


Figure 2: Effect on direct subsidy on welfare of rice consumers

At the initial market price P_0 , this increase in demand creates a shortage of rice of $Q_2 - Q_0$, exerting upward pressure on price. The market equilibrium price rises from P_0 to P_1 , encouraging producers to expand production and supply more rice. The new equilibrium is established at a higher quantity traded, increasing from Q_0 to Q_1 .

Overall, direct subsidies are effective in enhancing consumer welfare, as it increases affordability of rice (lower out-of-pocket payment) and larger availability of rice. This is particularly beneficial for low-income households that rely heavily on rice as a staple food and spend a larger share of their income on it. There is a rise in consumer surplus as the cash vouchers/transfers led to an increase in willingness to pay (reflected by the rise in demand curve), leading to a rise in the difference between willingness to pay and the actual price paid. The rise in quantity further reinforces the rise in consumer surplus as more consumers can buy rice now or consumers can buy more rice now.

R1-Anti-Thesis: Limitations of direct subsidies in increasing consumer welfare

However, the higher market price may reduce the effectiveness of the subsidy. The purchasing power of the lump-sum cash vouchers diminishes as prices rise, limiting the intended impact of increasing consumer welfare. Consumers who are not eligible for cash vouchers may be adversely affected as they face higher prices.

R1-EV: Evaluation of effectiveness of direct subsidies in raising consumer welfare

The extent to which direct subsidies improve overall consumer welfare depends on how effectively they are targeted towards the most vulnerable groups. If subsidies are targeted at low-income households, they directly raise the purchasing power of those who spend a larger proportion of their income on essentials such as rice. This leads to a significant improvement in affordability as the welfare gains are concentrated among those who need them most.

However, if subsidies flow to higher-income groups who are able to purchase rice without government support. This does not raise consumer welfare further as these households experience little or no change in consumption given that they had the spending power to access rice even before subsidies are given out. At the same time, if poor households are excluded from receiving the subsidy, the policy fails to effectively increase welfare of the most vulnerable group.

R2: Price Ceiling / Maximum Price on Rice

Thesis: Price ceilings can directly lower rice prices to protect consumer welfare

A price ceiling is a legally imposed maximum price on rice, intended to prevent prices from rising above a specified level. It is only effective if set below the market equilibrium price ($P_{\max} < P_0$), as shown in Figure 3.

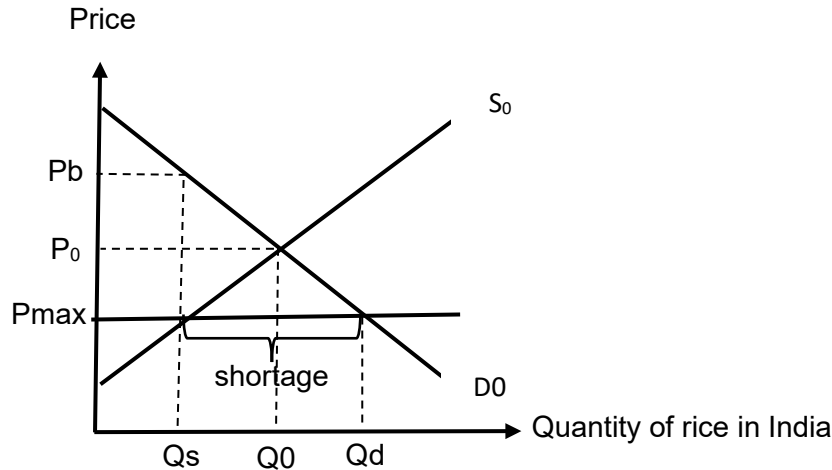


Figure 3: Effect of price ceiling (maximum price) on the market for rice in India and on consumers' welfare

As a form of price control (command and control policy), the price ceiling on rice is mandatory and enforced by the government. Rice producers are legally prohibited from selling rice above the stipulated $P_{\max}$, where violations will be subject to penalties, serving as a deterrent against non-compliance by rice producers. Once imposed, it directly lowers the market price to $P_{\max}$. By capping prices below equilibrium, the government ensures that rice becomes more affordable, particularly benefiting low-income households for whom rice is a staple good. This translates into lower expenditure not only on rice itself but also on rice-related products. As a result, some consumers who previously could not afford rice at P_0 are now able to access it at $P_{\max}$.

If the policy is enforced, where monitoring is strict and penalties on rice producers who flout the ceiling are severe, consumers are more likely to experience welfare gains.

R2-Anti-Thesis: Limitations of price ceilings in improving consumer welfare

- May create a **shortage of rice**

When a price ceiling is imposed below the market equilibrium, price of rice falls from P_e to $P_{\max}$. At this lower price, quantity demanded for rice increases from Q_0 to Q_d , due to income effect (real income and purchasing power increases as rice is now cheaper) and substitution effect (consumers switch towards rice as it becomes relatively cheaper than other staples such as wheat). As a result, there is excess demand for rice as $Q_d > Q_s$, creating a shortage equal to $(Q_d - Q_s)$.

While affordability increases for some consumers at the price ceiling, $P_{\max}$, accessibility is uncertain. Given the shortage of rice in the market at $P_{\max}$, some consumers who were previously willing and able to purchase rice at P_0 may not be able to purchase rice, and may face rationing and long queues. As a result, the gains in consumer surplus are uneven—those who manage to secure rice at the lower price benefit, but others who are left without access to rice are worse off. Thus, the policy may create inequity, hurting some households the policy aims to protect. Hence consumers' welfare might decline.

Furthermore, because price ceiling reduces revenue for rice farmers, it may not sufficiently compensate them for the opportunity cost of rice production. Farmers may not have the incentive to produce rice and may instead divert resources toward more profitable crops, such as wheat, further reinforcing the rice shortage in the domestic market in India. This further worsens accessibility and undermines consumer welfare in rice market, rendering the policy ineffective in achieving its intended aim.

- **Black markets may emerge if there is no effective monitoring**

There may also be the emergence of an underground (black) market, where sellers ignore the regulation and sell illegally at higher free-market prices. As a result of the shortage $Q_d > Q_s$ created (*explain how the shortage arise*), some consumers who are unable to obtain rice at the legal price P_{max} may be willing to pay a price above P_{max} to secure rice. Unscrupulous producers can exploit this shortage by charging up to P_b , the maximum willingness to pay for the Q_{th} unit, thereby eroding affordability and reducing consumer surplus. On top of that, the fall in price from P_0 to P_{max} reduces the profitability of rice production.

This creates inequity within the rice market in India. Producers may selectively sell to wealthier households willing to illegally pay above the ceiling, while poorer households are left unable to access rice. Hence, instead of improving affordability, the price ceiling can exacerbate inequality in consumption, disproportionately benefiting wealthier households who can afford to circumvent official prices, while reducing access to rice for poorer households who are not able to participate in such illegal transactions. If there are no effective monitoring or severe penalties on violators, rice producers and traders may disregard the price regulation, selling rice above P_{max} . In such cases, the policy becomes ineffective; not only does it fail to ensure affordability, but prices of rice in black markets may actually rise above those in the pre-ceiling equilibrium, making rice much less affordable than before price ceiling is implemented, worsening consumer welfare.

R2-EV: Evaluation of effectiveness of price ceiling in improving consumer welfare

The effectiveness of a price ceiling in raising consumer welfare depends on how low the ceiling is set relative to equilibrium price. If the ceiling is set substantially below equilibrium and for a prolonged period of time, the shortage ($Q_d - Q_s$) will be more severe, leading to persistent inefficiency. Consumers may face empty shelves, resort to buying in black markets at even higher prices or suffer from lower-quality rice due to producers cutting costs. In such cases, consumer welfare may worsen despite the lower official price.

Also, in the short-run, given the immediacy of such a regulation to depress the price of rice, price ceiling can offer short-term consumer protection, but may not be effective overall in improving consumer welfare in the long-run without policing to ensure compliance as the black market are likely to appear.

Concluding Evaluation: Comparative evaluation & taking stand to question

Reasoned judgement – a comparative evaluation

Students should make an overall judgement on the effectiveness of the two policies in raising consumer welfare in India's rice market. Effectiveness should be assessed in terms of whether the policy improves both **affordability** and **accessibility** of rice.

A **comparative evaluation of R1 and R2** should be given, taking into account the earlier analysis and applying it specifically to the context of rice in India.

Students should use comparative linking terms such as “*however*”, “*whereas*”, and “*on the other hand*” to clearly contrast the policies on the same factor and arrive at a reasoned conclusion on which policy is most effective overall.

On certainty of outcome, a price ceiling provides a more predictable and immediate reduction in rice prices, since the government legislates the maximum price. Consumers are guaranteed lower official prices, even if accessibility issues arise from shortages or black markets. By contrast, the outcome of subsidies on consumers welfare is less certain as it depends on several factors - whether producers pass on cost savings, whether the subsidy is sufficiently large relative to rising input costs, and whether structural barriers such as land or irrigation constraints prevent an expansion of supply.

In terms of time period, however, price ceilings can only suppress prices temporarily and risk worsening shortages or inequity over time. Subsidies, on the other hand, can address underlying cost drivers, thereby expanding supply capacity in the long run. As supply becomes more elastic over time, subsidies generate more sustainable welfare improvements by lowering production costs without creating persistent shortages or market distortions.

In conclusion, while price ceilings can serve as a temporary measure to guarantee affordability during sudden spikes in rice prices, they are less suitable as a permanent solution in a staple food market as it reduces accessibility, undermining overall consumer surplus gains. Subsidies, by contrast, is more effective long-term strategy to sustainably improve both affordability and accessibility of rice, without creating the market distortions associated with price ceilings.

Take a stand after comparison:

However, subsidies may not always be the **most effective** policy, since their success depends on government fiscal capacity, efficiency of implementation.

Suggestion:

In some contexts, **a combination** of targeted subsidies with buffer stocks or direct provision might yield greater welfare improvements.

OR

Complement indirect subsidies to producers with direct subsidies to consumers such as providing rice vouchers or targeted cash transfers, as the two are complementary. Indirect subsidies lower production costs and sustain supply in the long run, while direct subsidies immediately improve affordability and accessibility of rice, particularly for low-income households. Together, this ensures cost savings are passed on to consumers while preventing shortages, making consumer welfare gains more sustainable than either policy alone.

Mark Scheme:

Knowledge, Application, Understanding, Analysis		
L3	- Balanced answer with T-AT arguments and good scope and depth in explanation and discussion. - Well-developed analysis of how both policies impact consumer welfare. - Good use of economic framework to explain impact on consumer welfare, with the use of well-labelled and well-referenced diagrams. - Good application to the context of rice market.	8-10
L2	- Relevant economic analysis with some gaps in development/ analysis - Explained only R1 or R2 with limitations - Explained R1 and R2 but no limitations - Insufficient depth in explanation of the mechanism of the policies - Limited attempt to apply to the context of the question. - Limited reference to relevant diagrams.	5-7

	• Attempt at balanced answer. • Some minor lapses in economic analysis of either policy.	
L1	• Journalistic approach or descriptive responses with poorly developed policies. • Lack of economics framework or relevant economic concepts in analysis. • Significant conceptual errors in economic analysis throughout. • Missing links to effectiveness of the policies in impacting consumers welfare throughout. • Lack scope and balance e.g. only 1 policy explained.	1-4
	Evaluation	
E3	• Two evaluative judgements on the overall effectiveness of the policies in raising consumer welfare, both of which are well-explained and well-substantiated - R1 and R2 + summative conclusion.	5
E2	• Two evaluative judgements on the overall effectiveness of the policies in raising consumer welfare, one of which is well-explained and well-supported by valid reasons - R1 or R2 + summative conclusion.	3-4
E1	• An evaluative judgement on the overall effectiveness of the policies in raising consumer welfare, that is relevant but unsubstantiated – only R1 or R2 or summative conclusion.	1-2

Examiners' Comments:

- Most students were able to identify the relevant yardsticks for assessing consumer welfare, namely price (affordability), quantity (accessibility), and consumer surplus (CS). However, this question was generally poorly attempted, with many responses lacking sufficient depth in their analysis of the proposed policies impacting consumer welfare.
- While most students were able to accurately explain the mechanism and limitations of the policies, many failed to link their analysis back to the impact on consumer welfare. Changes in price and quantity were mostly correctly identified, but few elaborated on how these changes affect affordability and accessibility of rice for consumers. Explanations given tend to be descriptive and hence, did not fully address the question requirement.
- Students making the link to CS often did so superficially, merely stating that CS increases or decreases, or describing changes in the area on their diagram. A complete response should link the change in CS to its definition, comparing the price consumers are willing to pay vs price that they actually pay.
- Students also focused their analysis, particularly limitation of the policies on desirability of the policies rather than effectiveness of the policy in improving consumer welfare. Analysis should remain anchored to the extent to which each policy enhances the yardsticks mentioned.
- While most students were able to select relevant and accurate policies, some proposed income tax as a measure to improve affordability and accessibility in the rice market, which is conceptually illogical. Some students also chose both direct and indirect subsidies as their two policies, limiting the scope for meaningful comparison and analysis.

2. SingPost was the only basic mail service provider in Singapore because of its significant investments in postal service infrastructure which include the establishment of an extensive island-wide network of delivery routes, construction of sorting facilities and postal boxes. It was granted an exclusive license for basic domestic and international mail until 2007, when more competition was introduced that allowed entry of other firms in the provision of basic mail services.

(a) Explain why SingPost might be considered a monopoly prior to 2007 and how economic theory suggests this market structure would affect its pricing and output decision. [10]

(b) Discuss whether the introduction of more competition or price regulation is a more appropriate form of government intervention to improve efficiency in the provision of basic mail services in Singapore. [15]

Recommended mark scheme

a)

R1: Describe characteristics of monopoly (or natural monopoly) → only one firm dominating the market due to high BTE → Eg of relevant BTE (natural and artificial), nature of product, level of information

- In the strictest sense, a monopoly is defined as the **sole seller of a unique good** or service for which there are **no close substitutes** and there are **complete barriers to entry (natural or artificial)** in this market structure. Hence, for a pure monopoly, the **firm is the industry**.
- SingPost might be considered a monopoly prior to 2007 because it exhibited the key characteristics of a monopoly. In terms of **number of firms**, SingPost was the **sole provider of basic mail delivery services** between 1992 and 2007, and it had **no rival mail service providers** due to artificial barriers to entry (BTE), particularly statutory barriers in the form of its **exclusive license** to basic domestic and international mail delivery service → making its **mail delivery service unique with no close substitutes**.
- **High barriers to entry (BTE)** were present in the market for basic mail services, in the form of natural and artificial BTE. **Artificial BTE** ie. Statutory barriers: SingPost has been appointed by the government as the Public Postal Licensee since 1992, giving it the exclusive right and responsibility to provide basic mail services (eg. letters up to 500g) to all addresses in Singapore, preventing other players from competing against it legally since they are not granted licenses to provide mail services. **Natural BTE and exit** include the existence of **significant fixed costs** in constructing a nationwide distribution system that includes postal boxes, sorting centers and post offices that require prohibitively high capital investments → preventing other firms from entering due to the high initial capital outlay. These high start-up costs are also seen as sunk costs involved in entering this industry since the postal service infrastructure cannot be repurposed for other industries should the firm decide to leave the market → leading to **high barriers to exit** that discourage firms from contesting in this market since they are unable to recover the sunk costs. Additionally, the fact that SingPost processed and delivered a large amount of mail and parcels daily, allowed it to spread these high fixed costs over a large volume of output to reap significant internal economies of scale (IEOS), which are cost savings that could be translated into lowered prices of its mail services. Examples of IEOS include technical economies of scale in the case of factor indivisibility in which machines used in sorting facilities are indivisible regardless of the amount of mail processed, hence only firms with large scale of production can fully utilize the indivisible factor input. A new entrant into the industry would not be able to operate on a scale large enough to match SingPost's cost-efficiency, hence would be deterred to enter since they cannot match SingPost's competitive pricing and yet stay profitable.

- There exists **imperfect information** in the market for basic mail delivery services as consumers are not fully aware of the quality of the services and production methods of SingPost. Similarly, potential entrants into the industry may be unaware of SingPost's cost of production/methods of production.
- Taken together, these key characteristics confer SingPost its monopoly power (prior to 2007) and hence its price-setting ability, being the sole provider of a unique service in terms of basic mail delivery.

R2: Wrt monopoly diagram, explain profit maximising price and output level of the monopoly where $MR = MC$ and how this helps to determine the profit maximising output level and hence price to charge for the good/service.

- Given that SingPost was the only basic mail service provider in Singapore prior to its liberalization in 2007, its demand curve is the market demand curve. Additionally, its sole seller with a unique product's status also makes SingPost's demand curve high and very price inelastic in demand.
- Due to the significant fixed cost in developing the distribution system, SingPost is a natural monopoly and experience a downward sloping AC and MC curve. Answers that uses a regular monopoly diagram are also accepted.
- Assume that SingPost's aim is to maximise profits, where profits = TR-TC. It will produce at an output level where **$MR = MC$** . The profit maximizing output Q_M is attained at the output level where marginal revenue (MR) and marginal cost (MC) meets. (i.e. $MR=MC$).
- At the profit maximising output level, Q_M , SingPost will set the price P_M as seen from the AR / demand curve since the demand curve reflects the maximum price that consumers are willing and able to pay for the good.
- To derive the profit maximizing equilibrium output level, Q_M and price charged, P_M , the following is observed:

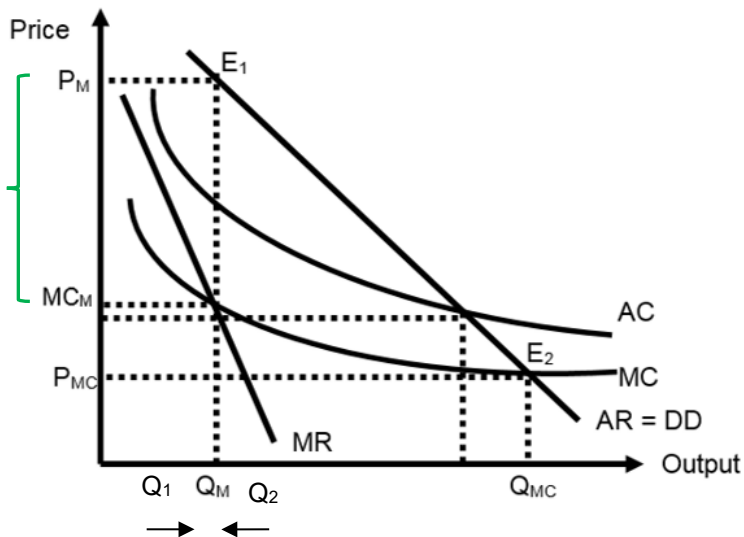


Figure 1

- Wrt Figure above, at output Q_1 , where $MC < MR$, the last unit of output produced adds more to the firm's revenue than it does to the firm's costs. By increasing the level of output, the additional revenue from an additional unit of good produced exceeds the additional cost of producing those extra units, hence higher level of production will result in higher levels of profits → firm should increase production to maximise profits.

- Conversely, at output Q_2 , where $MC > MR \rightarrow$ the last unit of output produced adds more to the firm's costs than it does to the firm's revenue. Production of that unit reduces the firm's total profits $\rightarrow$ to maximise profits, the firm should reduce production.
- Finally, at output Q_M , where $MC = MR \rightarrow$ the last unit of output produced adds as much to the firm's cost as it does to its revenue $\rightarrow$ hence, it is impossible to increase profits further by either increasing or decreasing production. This means that, at Q_M , total profits are maximised.
- As in Figure 1 above, the profit-maximising output is at Q_M where $MC = MR$. The high price, P_M and low output (compared to perfect competition where $P=MC$), Q_M are due to the monopoly position that SingPost has over the market giving it a highly price inelastic demand.

Conclusion:

The above analysis shows why SingPost might be considered a monopoly prior to 2007 and its price and output decision when profit is maximised i.e. the greatest positive difference between total revenue and total costs or when $MC = MR$.

Mark Scheme:

Knowledge, Understanding, Application, Analysis		Mark Range
L3	• Good scope of coverage, relevant application to context and thorough analysis with use of economic framework for both requirements – contextualized key characteristics of monopoly to SingPost and detailed analysis of the profit-max determination of price and output in the context of SingPost's monopoly over basic mail delivery services.	8 - 10
L2	• Lapses in scope of coverage and/or rigour in analysis and/or accuracy in the explanation of key characteristics of SingPost as a monopoly prior to 2007 and/or the use of the profit-max economic framework for determination of price and output for SingPost. • Addressed only 1 requirement (R1 OR R2) max 6m	5 - 7
L1	• Listing of points throughout without explaining • Glaring basic conceptual errors in knowledge & understanding • Journalistic style of writing without use of economic framework throughout • Mainly irrelevancies	1 - 4

Examiner's Comments:

- Students should utilize at least 3 out of the 4 key characteristics of market structures – number of firms, level of BTE, nature of product as well as level of information – to account for SingPost's monopoly status prior to 2007. Majority conveniently left out nature of product as well as level of information in their analysis.

- While students were able to identify that natural BTE were present in the basic mail delivery service industry, majority were unable to explain in detail, how these barriers deter entry of new firms beyond listing of high start-up costs. What should have been done would be to elaborate in detail with examples presented in the preamble about the extensive infrastructure involved in the provision of basic mail delivery services and now it could be a deterrent to new entrants, hence preserving SingPost's dominance in the industry. In this regard, students who merely listed the characteristics of high BTE without explaining **how** the different types of BTE made SingPost a monopoly prior to 2007 fared poorly for part (a).

- There were a handful of gross misconceptions with regards to the key characteristics of market structures and these include students stating that “there is perfect information within SingPost’s monopoly” or that SingPost had “imperfect information in operations”, reflecting a poor level of understanding of for this characteristic of market structures.

- With respect to R2 of part (a), majority of students were unable to grasp the requirements of the question that required them to apply the Marginalist Principle in explaining **HOW** profit-maximising output and price are determined in the monopoly market structure.

- Common errors here include cursory statements made about the profit-maximising condition and profit-maximizing price and output level without detailed analysis of why the monopolist maximises output at $MR = MC$ and how that would help determine the equilibrium price charged by the monopolist. A good number of essays were also irrelevant due to an over-emphasis on performance aspects such as efficiency and equity in a monopoly market structure (which is relevant to part b instead of a) or an over-emphasis on non-traditional objectives of firms such as revenue maximization or profit satisficing.

(b) Discuss whether the introduction of more competition or price regulation is a more appropriate form of government intervention to improve efficiency in the provision of basic mail services in Singapore. [15]

Introduction:

-Clarify that the introduction of more competition through reduction of BTE and price regulation either via MC or AC pricing, are forms of government intervention to increase the level of efficiency in the mail delivery market.

- Define the 3 main forms of efficiency: Allocative efficiency, Productive efficiency and Dynamic efficiency

- Clarify some common yardsticks used for assessing “appropriateness” of policies ie. Effectiveness of policy to attain efficiency, desirability of policies (unintended consequences), feasibility of implementation (with respect to the context or nature of the industry/country in question) etc.

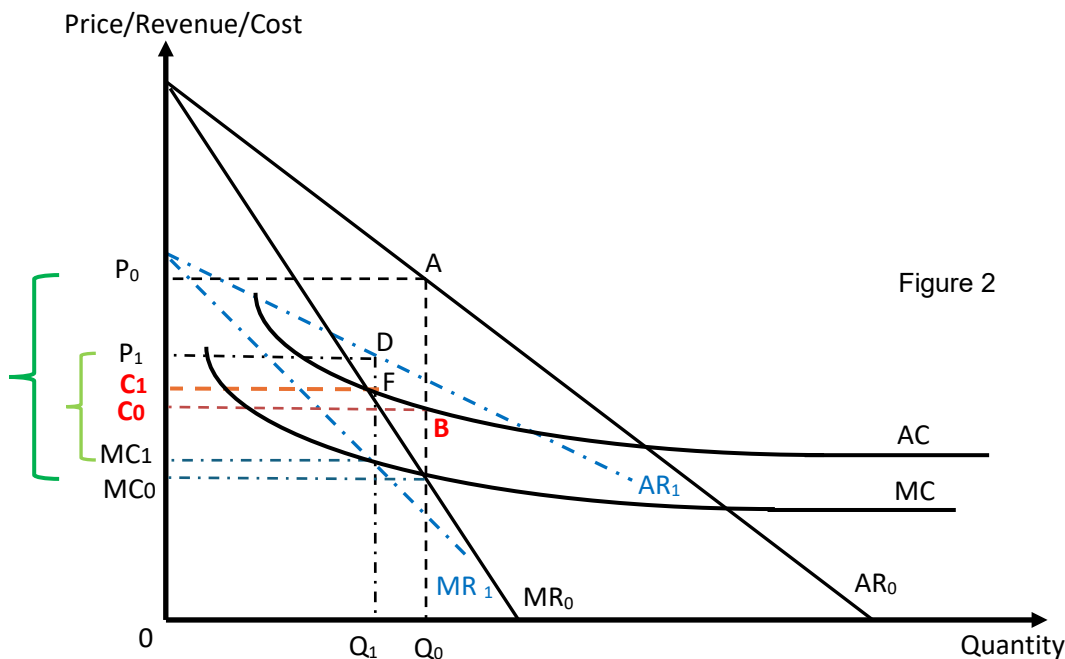
Brief explanation of SingPost’s monopoly leading to inefficiency → allocative, productive and dynamic inefficiency.

- With reference to Figure 1 in part (a), at profit maximizing equilibrium output, Q_M , SingPost charges a price of P_M , which is higher than its marginal cost of production ($P_M > MC_M$). This means that society values the last unit of the good more than the alternative goods forgone (i.e. opportunity cost), hence an underproduction of mail services relative to socially optimal level, Q_M and the extent of allocative inefficiency is seen as the distance $P_M > MC_M$. The monopolist produces a lower output at a higher price at P_M compared to the socially optimal level of output at Q_M where price charged is lower at P_{MC} . At output level Q_M , societal welfare can be increased with more units of delivery services produced. Hence, SingPost’s monopoly power leads to **allocative inefficiency** where mail delivery services are underproduced and underconsumed.
- As a government-protected monopoly, SingPost faced little pressure to minimise costs, leading to **productive inefficiency**. Without rivals, it could potentially operate with excess labour or outdated processes, producing above its average cost and display X-inefficiency.
- Additionally, being the sole provider of mail services, SingPost had weak incentives to innovate, since demand was guaranteed. This caused **dynamic inefficiency**, as it relied on traditional postal services rather than investing in automation or adapting quickly to e-commerce trends.

R1: Discuss how introduction of competition can be an appropriate form of government intervention to achieve efficiency in the provision of basic mail services.

Thesis: Explain how the **introduction of competition via reducing statutory BTE that allowed new firms to enter, works to achieve efficiency in basic mail services.**

- The Singapore government introduced competition into the basic mail delivery service industry by awarding postal service operations licenses to other firms to operate – Ascendia Singapore in 2007 and DHL in 2009.
- For the incumbent firm SingPost, the introduction of competition via the entry of these 2 new firms will result in its AR and MR to fall since some of its consumers switched to consuming the postal services offered by the new entrants. At the same time, its AR and MR also become less price inelastic (gentler) due to an increase in availability of substitutes for its mail delivery services → **extent of allocative inefficiency falls as seen from the reduction in difference between P_0 and MC_0 to P_1 and MC_1** in Figure 2. As more firms enter the postal service industry, more mail delivery services become available → **less underproduction/underconsumption** compared to before introduction of competition → **extent of allocative inefficiency reduces**.
- With regards to productive efficiency, increasing competition levels in basic mail services → greater incentive amongst SingPost and new entrants to adopt more **cost-efficient methods** of production and **reduce X-inefficiency** (of SingPost) in order to maintain its profits in the face of a fall in demand.
- Finally, when competition is introduced, SingPost will have greater **incentive to adopt tech changes** eg. Invest in automation or branch into ecommerce to revolutionise its services → higher quality/more novel methods of provision through process and product/service innovation → **more dynamically efficient**.
- Hence, government intervention to **increase the level of competition** in mail services industry is **effective at improving efficiency** in basic mail services.



Anti-thesis: Limitations of introducing competition (Any one point)

- **Effectiveness** (for mail delivery of letters up to 500g, the postal services market was liberalized to allow 2 other firms to operate – DHL eCommerce and Ascendia Singapore (both are awarded Postal services operations licenses), however, these new firms pose limited competition to SingPost in basic mail services because SingPost, being the sole public licensee still handles majority of basic mail services → the 3 firms essentially compete in different markets – DHL eCommerce and Ascendia primarily target business and direct mail services for marketers instead of basic letter delivery → **ineffective in improving/achieving efficiency** since the licenses are for operating in different market segments → no actual direct competition.
- **Effectiveness in achieving efficiency via introducing more competition** is also negated by the fact that SingPost has long established its foothold in the mail services industry and there may be some form of customer loyalty gained such that its demand (AR and MR) may not fall as significantly despite the entry of new firms and with that, the extent to which allocative, productive and dynamic efficiency will be improved becomes limited.
- **Desirability**: entry of new firms into SingPost's postal service market reduces its supernormal profits (from P_0ABC_0 to P_1DFC_1) hence reduce its ability to engage in product/service development that can increase dynamic efficiency, provide more choices/variety or higher quality mail services to consumers or process innovation that can develop more cost-efficient methods of provision that can potentially lower unit COP that can be passed on as lowered prices to consumers. Additionally, the introduction of competition reduces SingPost's scale of provision of mail services → reduces its ability to reap IEOS from large scale production → less cost savings can be reaped by SingPost to be passed on to consumers as lowered prices → **undesirable to consumers**.

R1 EV1: Judgment provided as to whether introducing competition is an appropriate way to improve efficiency in the provision of basic mail services in Singapore.

- Given the **nature of the basic mail delivery services** industry that exhibits characteristics of a natural monopoly in Singapore due to the large MES relative to the size of Singapore market, the AC and MC likely falls continuously over a large range of output due to the high costs and indivisible nature of postal infrastructure, **introducing competition may not necessarily be a feasible approach** to improve efficiency. This is because increasing number of firms will reduce the scale of production of the incumbent SingPost such that AC and MC rises as a result of the inability to reap significant IEOS. This, coupled with a fall in demand (AR) may lead to subnormal profits made by SingPost and if other entrants operate on a smaller scale are unable to profit from the production of mail services → missing market for basic mail delivery services since they may all choose to exit in the long run. This would result in a worsening of allocative inefficiency.
- Hence, given the small size of Singapore's market, tech advancements and digital disruptions to the mail delivery market (eg. Email and e-billing replacing traditional mails), demand for traditional mail delivery services would have fallen and the shrinking market makes it unprofitable for multiple firms to sustain operations. Therefore, introducing direct competition to SingPost's monopoly power may **not be the most feasible and desirable approach**. Competition is more feasible in related segments such as parcel delivery and logistics, where demand is rising due to e-commerce and barriers to entry also tend to be lower. A more practical approach may be government regulation of SingPost through price regulation and service quality standards, which can prevent exploitation of monopoly power while ensuring efficiency, without the duplication of costly infrastructure.

R2: Discuss how price regulation can be an appropriate way to regulate SingPost → improve efficiency in provision of basic mail services.

Thesis: Explain how price regulation (MC or AC pricing) works to regulate SingPost → reduce allocative, productive and dynamic inefficiency.

- Assuming that SingPost operates in a natural monopoly structure, the government can impose price regulation, **MC pricing** on SingPost's basic mail delivery services which requires it to **produce and charge a price that is equal to the marginal cost of production**. Referring to Figure 3, SingPost will price its services at P_{MC} and produce output Q_{MC} where $AR = MC$. Compared to a case prior to any form of government intervention, where SingPost would be profit maximizing at price P_M and output Q_M , government intervention in the form of MC pricing regulation results in a lower price charged and higher output produced/consumed. This helps to **achieve allocative inefficiency** effectively since it is now producing at the socially optimal level of output and charging a corresponding price that is socially optimal.

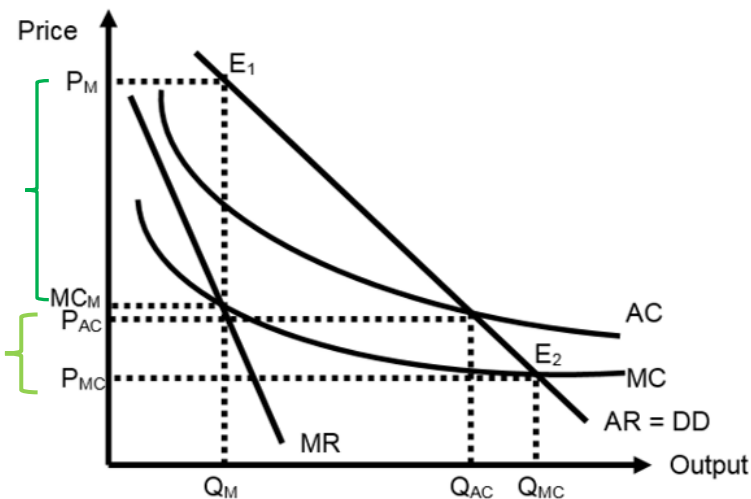


Figure 3

Anti-thesis: Limitations of price regulation (Any one point and can be analyzed in the context of natural monopoly)

- Effectiveness:** MC pricing may not achieve its intended effect of attaining AE where $P=MC$ if the government does not possess perfect information wrt SingPost's cost structures. There is very little incentive for SingPost to disclose its cost structures, in fact, it is more likely that SingPost withholds information and report higher MC to retain some supernormal profits from its operations. **Without perfect information**, the government's price regulation approach becomes **ineffective at achieving AE**.
- Additionally, MC pricing results in subnormal profits suffered by SingPost, because at Q_{MC} , it incurs a higher AC than P_{MC} . This reduces its ability to engage in R&D to develop more effective/efficient processes in mail delivery or to innovate on its services provided → **increases the extent of dynamic inefficiency** associated with monopoly power → **ineffective at improving efficiency**.
- Desirability:** Given the subnormal profits that SingPost suffers due to MC pricing, the government may have to subsidise the losses to ensure the viability of mail delivery services or risk SingPost shutting down and exiting the industry. This is **undesirable** because **long term subsidization drains the government's budget** and in turn creates a **high opportunity cost** since the **forgone benefits** of such **spending on other key sectors** such as education, healthcare and infrastructure would be massive.

R2 EV2: Judgment provided as to whether price regulation is an appropriate way to improve efficiency in the provision of basic mail services in Singapore.

- Given the high costs of implementing MC pricing, government needs to consider whether attaining AE is indeed a priority in basic mail delivery services industry. If the government can accept some extent of allocative inefficiency present in the market, then **AC pricing might be a more appropriate and desirable policy** to implement since regulating SingPost to produce and charge at $P=AC$ at Q_{AC} and P_{AC} in Figure 3 enables SingPost to make at least normal profits and eliminates the government's need to subsidise SingPost to ensure its viability. This helps to eliminate the high opportunity costs involved in implementing price regulation, yet $Q_{AC} > Q_e$, which is the profit-maximising output without government intervention but $Q_{AC} < Q_{MC}$, which is the socially optimal level of output, therefore the extent of allocative inefficiency is reduced with AC pricing.

Overall Evaluation: Weigh the 2 policies to arrive at judgement and provide justification of which is a more appropriate policy to improve efficiency based on yardstick/s chosen, objective of regulation, timeframe etc.

- Between the 2 forms of government intervention, price regulation (MC or AC pricing) tends to be **more effective** at attaining/improving allocative efficiency with **immediacy and certainty** as long as the government has adequate information wrt the cost structures of SingPost. This makes either of them **appropriate short-term measures** to improve efficiency, particularly AE, should it be the priority of the government. However, **relative to MC pricing, AC pricing** presents itself as a more **feasible approach** for regulating SingPost, when combined with other supplementary regulations such as service benchmarks to reduce inefficiency. AC pricing can be seen as an effective compromise between achieving allocative efficiency and maintaining viability of the firm, especially in a natural monopoly setting of the basic mail delivery services industry.
- Introducing competition by removing statutory barriers may yield results but tend to take longer depending on new entrants' ability to scale up and compete against SingPost effectively. However, since **regulatory pricing** often requires a higher level of government involvement, be it in monitoring pricing and cost structures of the monopoly or in subsidizing its losses to ensure its viability, it tends to be **less sustainable than introducing competition** into the basic mail delivery market.
- In the **long run, the more appropriate policy (feasible and desirable) would be to introduce competition** into the mail delivery service industry since contestability is critical in incentivizing R&D that could drive stronger productive and dynamic efficiency as firms face pressure to reduce costs and innovate delivery processes in this digital age.

Mark Scheme:

Knowledge, Understanding, Application, Analysis		Mark Range
L3	- Good scope of coverage, relevant application to clear economic framework and thorough discussion of how both policies work – introduction of competition and regulatory pricing as well as their limitations at improving efficiency in basic mail delivery services in Singapore's context. - Explicit reference made to the yardsticks used to assess "appropriateness" of both policies ie. Effectiveness of policy to attain efficiency, desirability of policy or feasibility of implementation etc.	8 – 10

L2	• Lapses in scope of coverage and/or rigour in analysis and/or accuracy in the discussion of how both policies work – introduction of competition and regulatory pricing as well as their limitations at improving efficiency in basic mail delivery services in Singapore's context. • Answers that discussed the appropriateness of only one policy (R1 OR R2) - OR one-sided answers that only addressed how both policies work/ their limitations. (max 6m)	5 – 7
L1	• Listing of points throughout without explaining • Glaring basic conceptual errors in knowledge & understanding • Journalistic style of writing without use of economic framework throughout • Mainly irrelevancies	1 – 4
E3	• Judgements provided for 2 requirements with explanation and contextualisation PLUS a summative judgement in the concluding paragraph	5
E2	• Judgements provided for 2 requirements with explanation and contextualization	3 – 4
E1	• Judgements lack explanation and/or contextualization OR judgement provided for only 1 requirement with explanation and contextualisation	1 - 2

Examiner's Comments:

- Majority of students fared badly for this part of the essay due to a poor grasp of the requirements of the question, with a good number of overly-rehearsed answers that focused merely on the advantages and disadvantages of the 2 forms of government intervention – increasing level of competition and regulatory pricing – without assessing the appropriateness of each policy using common yardsticks such as effectiveness of policy in attaining various aspects of efficiency, desirability (unintended consequences) of each policy and finally, feasibility in the implementation of each policy given the context of SingPost.
- There were also a large number of students who went off-focused and presented answers that were misdirected at assessing how the 2 forms of government intervention would improve consumer welfare in terms of reducing prices, increasing quantity, quality and variety of basic mail delivery services, without any mention of efficiency aspects.
- Other essays that went off-focused and hence lacked scope in analysis include those that were overly focused on allocative efficiency without any mention of other efficiency aspects such as productive and dynamic efficiency.
- Some students made the error of writing at length on the application of a price ceiling on SingPost's basic mail delivery services using a demand and supply framework.
- There seems to be a poor conceptual understanding of regulatory pricing policies – AC and MC pricing – with many students identifying the conditions for AC and MC pricing incorrectly, especially in relation to the diagram they had drawn ie. Students are unable to accurately determine the equilibrium output and price level where AR cuts AC (for AC pricing) and AR cuts MC (for MC pricing).
- Other errors relating to diagrams drawn include an inability to determine the extent of allocative inefficiency ie. Vertical distance between P and MC at profit-maximising output level. Many students incorrectly labelled the extent of allocative inefficiency as the vertical distance between P and AC at profit-maximising output level.

3. From January 2026, all young children in the UK will be offered a free chickenpox vaccine by the National Health Services (NHS). Until now, parents who wanted to protect their child against chickenpox usually have to pay up to £200 privately. Chickenpox, which is highly contagious, causes an estimated £24m in lost income and productivity every year in the UK, as parents take time off work to look after the sick child. Despite the free provision, the government is concerned about uptake, given that vaccine hesitancy has increased after the Covid pandemic.

Source: BBC News, 29 August 2025

- (a) Explain two reasons why market failure may arise in the market for chickenpox vaccination. [10]
- (b) Discuss whether free provision of chickenpox vaccine or education and campaign is a better policy to ensure vaccinations are allocated efficiently. [15]

Part (a)

Introduction:

- Market failure refers to the failure of the price mechanism to allocate resources efficiently.
- Efficient allocation of resources refers to the combination of goods and services produced and consumed that maximises society's welfare.
- The two reasons why market failure may arise in the market for chickenpox is due to positive consumption externalities and imperfect information amongst parents or carers.

R1: Market failure arises due to the presence of positive consumption externalities

Step 1: Identify the market and identify externalities

- Vaccinating children against chickenpox creates positive externalities because there are benefits accruing to the society at large (3rd parties), which are not involved in the production or consumption of vaccines.

Step 2: Explain, with the use of examples, the MPB and MPC

Consumers and producers both seek to maximise their utility and profits respectively. Rational decision making requires the consideration of the marginal benefits and costs.

- The demand curve reflects the MPB of consuming vaccines. It shows the additional satisfaction or benefit the private consumers gain from each additional unit of vaccine consumed. These private benefits include the vaccinated child's immunity against chickenpox and vaccinated child's parents not having to take time off work.
- The supply curve reflects the MPC of producing vaccines by pharmaceutical companies, such as the costs of raw materials etc. Assuming no production externalities, the MPC of producing vaccines is the same as the MSC (i.e., $MPC=MSC$).

Step 3: Explain, with the use of examples, the presence of MEB of consumption

- When enough children are vaccinated against the chickenpox virus,
 - the spread of virus slows down, protecting those who cannot be vaccinated (3rd parties) from contracting chickenpox in the community. Chickenpox is highly contagious, implying many unvaccinated individuals could be protected.
 - OR workforce productivity increases, as parents need not take time off work to care for their sick child. This benefit spills over to employers (3rd parties) who will gain higher revenue. When higher productivity (increase in output per worker) leads to higher economic growth, more tax revenue can be collected and redistributed to lower income households (3rd parties)
 - OR burden on the healthcare system is reduced, as fewer infections mean fewer doctor visits, hospitalisations and treatments for complications. Medical staff can be relieved to treat patients

suffering from other diseases (3rd parties), and overall healthcare costs borne by taxpayers (3rd parties) is reduced.

Step 4: Explain and illustrate the divergence between MPB and MSB due to the presence of MEB

- In the pursuit of self-interest, there is a divergence between the marginal social benefit (MSB) and the marginal private benefit (MPB) by the extent of marginal external benefit (MEB) for the consumption of chickenpox vaccines, as shown in Figure 1.

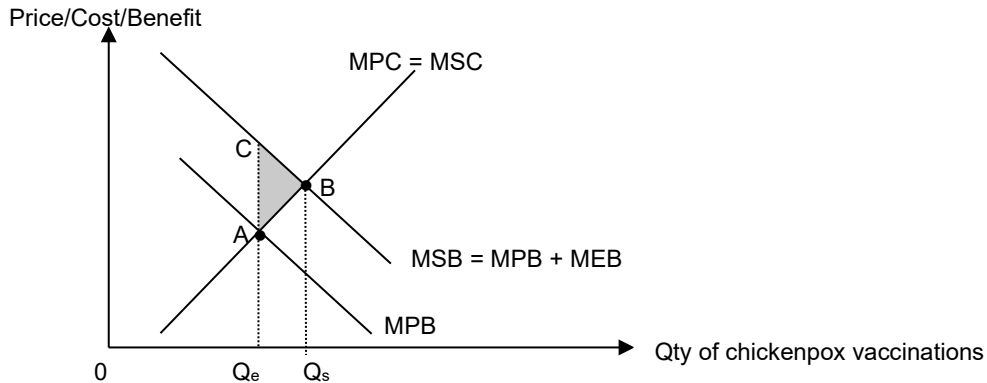


Figure 1

Step 5: Identify the free market equilibrium output vs society's optimal level of output

- In the pursuit of self-interest by both consumers and producers, the free market output level is Q_e units of vaccinations where MPB equals MPC. However, the socially optimal level of output which maximises society's welfare occurs at Q_s , where $MSB = MSC$.

Step 6: Identify the underconsumption of chickenpox vaccines and the area of deadweight loss

- Hence, since $Q_e < Q_s$, the market fails to achieve allocative efficiency and $Q_e Q_s$ units of vaccination is under-consumed in the free market.

Step 7: Explain deadweight loss to society arising from underconsumption

- The benefits forgone from not consuming $Q_e Q_s$ units of vaccines is greater than the resources saved in not producing $Q_e Q_s$ units of vaccines, resulting in a net benefit forgone to the society as represented by the deadweight loss area of ABC. This inefficient allocation of resources thus explain the market failure.

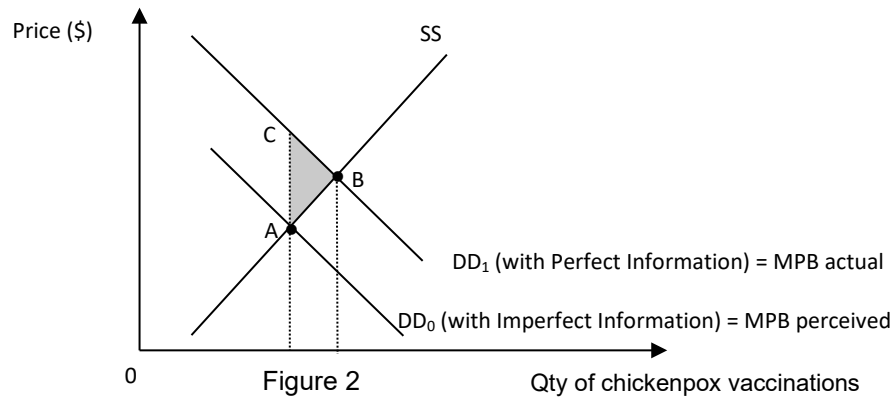
R2: Market failure arises due to private individuals having imperfect information about (and thus, undervaluing) the true benefits of getting chickenpox vaccinations.

Step 1: Explain why decision makers undervalue the true MPB of getting chickenpox vaccinations

- Parents may underestimate the benefits of getting their children vaccinated as chickenpox is often perceived to be comparatively 'mild'. Parents may not fully understand the risks of serious complications that can arise from chickenpox outbreaks, and associated costs e.g. lost income from taking time off from work, medical expenses and disruption to daily routines
- Parents may also be influenced by misinformation on vaccinations, exaggerating the risk of side-effects - that it weakens the child's immunity and causes autism, etc.

Step 2: Explain and illustrate the divergence between demand under imperfect information and demand under perfect information due to imperfect information about true MPB from consumption

- According to Figure 2, due to imperfect information, parents will underestimate the actual benefits of having the child vaccinated. Hence, the demand for chickenpox vaccinations will be lower at DD_0 with imperfect information where they only consider the perceived benefit of chickenpox vaccines. However, with comprehensive and accurate information, the actual/real private benefits of consuming chickenpox vaccines will be at DD_1 .



Step 3: Identify free market output level vs socially optimal output level

- Hence, Q_e is the free market level of consumption where DD_0 (imperfect) intersects with SS . This is lower than the society's optimal level of consumption at Q_s , where DD_1 (perfect) intersects with SS . This results in an underconsumption of $Q_e Q_s$ units of chickenpox vaccinations.

Step 4: Explain deadweight loss to society as a result of underconsumption

- As a result, there is a deadweight loss of area ABC to society which reflects the net benefit forgone from under-consumption. This explains the 2nd reason why there is market failure in the market of chickenpox vaccination.

Hence, the market for chickenpox vaccinations fails because of the existence of positive externalities from consumption as well as imperfect information.

Mark Scheme:

Knowledge, Application, Understanding and Analysis		
L1	- For an answer that shows vague knowledge of the two sources of market failure - Significant conceptual gaps in explanation - No use of relevant economic framework applied. - Descriptive explanation of answers	1-4
L2	- Made clear reference to relevant economic framework. - For an answer that explains both sources of market failure though there are some gaps in explanation. - Used examples to demonstrate application with reference to the context of chickenpox vaccinations.	5-7
L3	A well-developed answer that demonstrates:	8-10

	• <i>Rigorous analysis for both sources of market failure (positive externalities and imperfect information).</i> • <i>Good application to market for vaccinations throughout the essay.</i> • <i>Clear and comprehensive use of relevant economic framework</i>	
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Examiners' Comments:

- *Most students demonstrated a clear understanding of the question requirements and generally performed well for part (a). Their responses showed good organisation and logical, step-by-step analyses of the two sources of market failure, supported by the appropriate economic framework and examples.*
- *A number of students struggled to differentiate between the two sources of market failure. Imperfect information relates to failure to recognise the true benefits to the decision maker themselves whereas positive externality relates to the benefits enjoyed by third parties which the decision maker disregards even if they may be aware.*
- *Quite a number of students did not contextualise their analysis with relevant examples. Such responses merely regurgitated theory and provided rehearsed answers.*
- *Many students did not explain how Q_e and Q_s are determined – students should state clearly the condition for free market equilibrium (where $DD_{imperfect}=SS$ or $MPB=MPC$) and socially optimal allocation (where $DD_{perfect}=SS$ or $MSB = MSC$).*
- *Several students also omitted explanation of rational decision-making by consumers and producers at the free-market equilibrium, particularly how decisions are guided by self-interest. Similarly, for the explanation on imperfect information, students did not elaborate in context on why there is a divergence between DD under imperfect information and DD under perfect information.*
- *Many students did not explain why and how the deadweight loss arose.*

Part (b)

Introduction

To address the underconsumption of chickenpox vaccinations from positive externalities and imperfect information, the UK government can intervene through free provision or education and campaigns. The policies could be weighed in terms of their effectiveness, costs and desirability.

Body:

R1: Thesis - Free provision will be effective in achieving efficient allocation of chickenpox vaccinations, assuming the government can set Quantity supplied where $MPB = P = 0$ and Q_{foc} coincides with the socially desired output level.

- Free provision by the government means that the good or service is provided at zero price to the consumer, with the cost fully covered by the government. By providing the good for free, the government is incentivising consumers to internalise the externality by reducing the price consumers pay, to zero.
- When the government provides chickenpox vaccines at $P=0$ to the consumer, quantity demanded of vaccinations increases to Q_{foc} where $MPB=P=0$ as consumers' ability and willingness to consume increases when price falls to zero.
- The fall in price from P_e to 0 (zero) results in a movement downwards along the demand (MPB) curve to where the demand curve cuts the x-axis at Q_{foc} . As a result, quantity demanded increases from Q_e to Q_{foc} .

- Assuming Q_{foc} coincides with the socially desired output level Q_s (MSB equals MSC) and the government sets the quantity supplied at Q_{foc} , deadweight loss of area ABC is eliminated and allocative efficiency will be achieved.

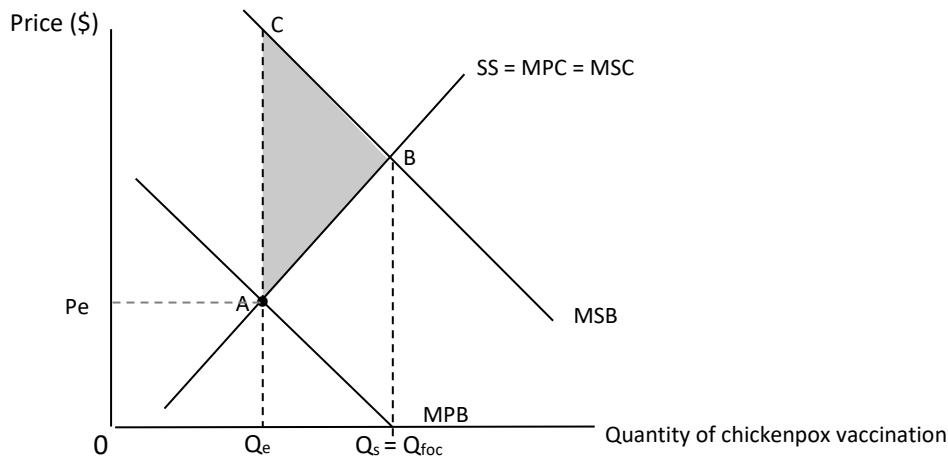


Figure 3

Free provision is thus an effective policy to achieve efficient allocation of chickenpox vaccinations when significant external benefits exist, such that a price of zero is needed to encourage consumption level to increase sufficiently to the socially desired output level at Q_s .

Anti-thesis – However, free provision may not be fully effective or may be inappropriate in addressing the underconsumption of chickenpox vaccinations as there may be potential limitations and/or unintended consequences.

(Choose any 2 to explain)

- In terms of effectiveness, the government **may not possess perfect information** and is therefore unable to accurately determine the socially optimal level of output to provide. This means that the quantity supplied by the government at $P = 0$ may undershoot or overshoot the social optimum. Accurately measuring the external benefits generated by chickenpox vaccination is particularly challenging because when one individual is vaccinated, it not only lowers the risk of exposure for those in close contact but may also protect many others indirectly through reduced transmission. The true magnitude of these third-party benefits is difficult to quantify. As a result, if the quantity supplied is below the socially optimal level, underconsumption persists and deadweight loss remains. Conversely, if the government oversupplies relative to the social optimum, a new deadweight loss from overconsumption arises. This highlights how the effectiveness of free provision in achieving allocative efficiency is limited by informational constraints, even if affordability is guaranteed.
- (Effectiveness) Moreover, free provision **does not target a critical root cause of the problem which is hesitancy caused by imperfect information**. If parents continue to harbour wrong perceptions about side-effects of vaccines, even when the vaccination is provided for free, parents are unlikely to have their child vaccinated as the perceived non-monetary costs still outweigh the benefits. As a result, uptake may still fall short of the socially optimal level.
- (Desirability) While free provision guarantees affordability, the **quantity supplied may fall short of quantity demanded due to budget constraints**. In the case of free provision of chickenpox vaccinations, this can lead to longer queues and increased waiting times in hospitals. If additional manpower and resources are not provided, the quality of service may deteriorate for all patients. This outcome would be undesirable for consumers, who face greater inconvenience and reduced service quality, and for the government, which may face public dissatisfaction and political pressure to increase spending.

- *(Desirability)* Additionally, free provision may put **significant strain on government budget** as the government would need to provide millions of vaccinations a year, incurring costs in procurement, logistics and manpower. There is high opportunity cost as the resources could have been spent on other national priorities like expanding hospitals or on education. Thus, while free provision may be effective in increasing uptake, the significant fiscal burden raises concerns about its desirability as a long-term policy tool.

R1 EV:

- Upon evaluation, while free provision may not fully achieve allocative efficiency due to difficulties in setting the socially optimal quantity, it remains effective in reducing underconsumption and represents a move in the right direction. Beyond efficiency, free provision is also highly desirable from an equity standpoint, as it ensures universal accessibility regardless of income. Previously, parents in the UK had to pay around £200 privately to vaccinate their child against chickenpox, which could be unaffordable for low-income households. By removing this financial barrier, free provision enhances both equity and consumer welfare.
- OR Upon evaluation, although free provision imposes a significant fiscal burden on the government, it can still generate a net gain in social welfare if the cost of providing vaccinations is lower than the estimated £24 million in lost income from chickenpox annually. In a high-income country such as the UK, where the National Health Service (NHS) incurs substantial hospitalisation and outpatient costs from chickenpox complications, the long-term savings from fewer hospital admissions and parental work absences may justify the upfront expenditure. Over time, as infection rates fall and treatment demand declines, there would also be less strain on the healthcare system

R2: Thesis – Education and campaign is effective in raising the free market level of chickenpox vaccination to the socially optimal level.

- The UK government could educate parents and caregivers via roadshows or public talks and mainstream media broadcasts to close the information gap about the true private benefits of chickenpox vaccinations for their children. For example, information on long-term benefits and potential side-effects could be published on official websites, such as the patients' portals and official health apps, to make this information accessible to their target audience. As vaccine hesitancy is high after Covid-19, the government could engage renowned and credible experts to allay parents' concerns and dispel myths about the chickenpox vaccines.
- As shown in Figure 4, parents who are more accurately informed will seek to maximise their self-interest by increasing their demand for chickenpox vaccinations from DD_0 to DD_1 (or adjust their MPB perceived closer to MPB actual). Via the price adjustment process, the socially desirable level of Q_s will be achieved.

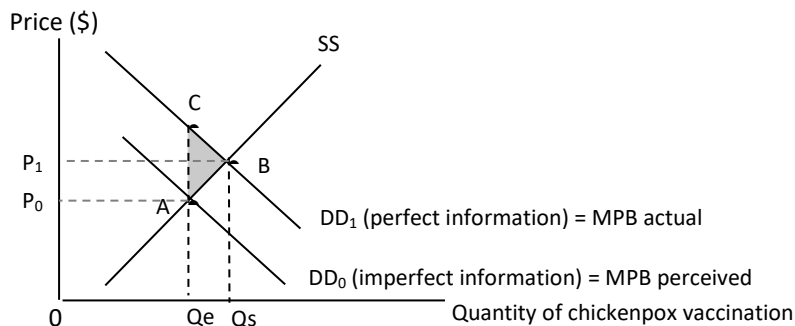


Figure 4

- Education and campaign is an effective policy to address the root cause of underconsumption – vaccine hesitancy in the case of chickenpox vaccination in the UK, by closing the information gap between perceived and actual private benefits of vaccination.

Anti-thesis – However, education and campaigns may not be fully effective or may be inappropriate in addressing the underconsumption of chickenpox vaccinations as there may be potential limitations and/or unintended consequences.

(Choose any 2 to explain)

- In terms of effectiveness, education and campaigns may be limited in achieving efficient allocation of resources in the market for chickenpox vaccinations as **some parents may remain unconvinced regardless of campaigns due to deep rooted misbeliefs and distrust** toward vaccinations. Misinformation spread quickly and widely by capitalizing on consumers' fears and sensations, aided by the digital age. Therefore, demand for chickenpox vaccinations will not increase as much as the government would like, and consumption of vaccinations might fall short of Q_s .
- *(Effectiveness)* Moreover, education and campaigns may be limited in their effectiveness in the short run, as **changing consumer mindsets and correcting misconceptions takes time**. As such, underconsumption may persist in the immediate term, delaying progress towards allocative efficiency.
- In terms of desirability, education and campaigns, while effective in raising DD_0 (perceived MPB) closer toward the DD_1 (MPB actual), may cause the price of vaccinations to increase from P_0 to P_1 . Some parents who are willing to have their child vaccinated **may be priced out of the market due to inability to pay**, reducing accessibility and worsening inequity.
- *(Desirability)* Additionally, education campaigns can be **costly and may put a strain on government resources**, particularly since they must be sustained in the long term to be effective. Outreach activities such as roadshows, community engagement, and media advertising require extensive planning, logistics, and manpower, incurring significant expenses. The opportunity cost is also substantial, as these funds could instead be allocated to other priorities, such as improving pre-school education or providing healthcare to other patients.

R2 EV:

- Upon evaluation, education and campaigns can be an effective policy in moving the vaccination market closer to allocative efficiency, particularly when imperfect information is a significant root cause of underconsumption. By improving public understanding of the private benefits of vaccination, these campaigns can help increase demand and reduce information gaps. Beyond efficiency, this policy is also desirable because it can generate long-term societal returns by shaping more positive attitudes toward vaccines in general. Success in increasing the uptake of chickenpox vaccines can spill over to other vaccination programmes, thereby lowering overall vaccine hesitancy and strengthening population health resilience.

Concluding evaluation (Choose any 2 common yardsticks/ basis for comparison):

- In conclusion, whether free provision or education and campaigns is the better policy to achieve efficient allocation of resources in the market for chickenpox vaccinations depends on both effectiveness and desirability.
 - **(Compare effectiveness and desirability based on time period)** Free provision can rapidly increase uptake in the short run by targeting rational decision consumers where the high cost (£200) outweigh the benefits, but it does not address the root cause of underconsumption, namely vaccine hesitancy. Education and campaigns, while slower to impact in the short run, are more effective in the long run by closing information gaps and shifting demand closer to the socially optimal level.
 - **(Compare effectiveness and desirability based on severity of the problem)** Given that chickenpox is a low-severity, endemic disease, education and campaigns are more desirable

as they are cost-effective and promote wider societal understanding, whereas free provision imposes significant fiscal and logistical burdens, though it improves equity.

- **(Compare feasibility based on country context)** Overall, for chickenpox in the UK, education and campaigns are the better policy for achieving long-term allocative efficiency, while free provision may complement the approach for low-income households, making a combined strategy ideal for both short- and long-run effectiveness. In developing countries, where literacy rates may be lower, public trust weaker, and fiscal resources more constrained, free provision may be the better policy to rapidly increase uptake, while education and campaigns serve as a complementary long-term measure.
- **Include a recommendation forward:**
 - If a country has sufficient resources like Singapore, it could adopt both policies: free provision as a quick remedy to underconsumption, and public education for its long-lasting and wider benefits. In resource-constrained countries, it is more efficient to prioritize education and campaigns over universal free provision for chickenpox vaccination, as they are cheaper, can target low-uptake groups, and nudge consumption toward the socially optimal level, while free provision may be reserved for high-risk populations due to its high fiscal cost.
 - **OR** Given limited government budget, government may choose a tiered approach to free provision – for example, free provision for high-risk groups or low-income groups and taking a targeted approach to campaigns and outreach to those who are most susceptible to misinformation. Ultimately, policymakers must weigh effectiveness, desirability, equity, and feasibility when designing vaccination strategies, and a combined approach often provides the most balanced solution.

Mark Scheme:

Level	Knowledge, Application/Understanding and Analysis	
L1	• Vague or inaccurate knowledge of how free provision (R1) and public education and campaigns (R2) work • No use of relevant economic framework or analysis applied • Unexplained listing of points • Critical errors in analyses of intervention • Descriptive explanation of answers • No application to the context using relevant examples – a purely theoretical response	1 – 4
L2	• Some economic analysis of the free provision and public education and campaigns using a relevant economics framework • Some contextual examples provided • Some gaps or lapses in analyses of interventions. • Some discussion of effectiveness and 1 other yardstick of R1 and R2 measures • Only 1 R, max 6	5 – 7
L3	▪ Good scope of coverage of interventions ▪ Detailed analysis and discussion of the respective R1 and R2 measures based on effectiveness and any other yardsticks such as desirability and cost ▪ Good use of context throughout	8 – 10
	Evaluation	
E1	▪ Judgements lack explanation/justification and/or contextualization OR judgement provided for only 1 requirement with explanation and contextualisation	1-2
E2	▪ Judgements provided for 2 requirements with explanation and contextualization	3-4
E3	▪ Judgements provided for 2 requirements with explanation and contextualisation PLUS a summative judgement in the concluding paragraph	5

Examiners' Comments:

- *In general, the explanation for free provision was poorly done. Many scripts:*
 - *Wrongly analysed the impact of free provision of vaccines by the government as a shift of the MPB curve. A change in price results in a movement along the MPB curve (and not a rightward shift of the MPB curve).*
 - *Wrongly concluded that the price of the vaccine is zero where MSB = 0. Prices are determined by the interaction of self-interested consumers and producers along the MPB and MPC curves, not by the marginal social benefit curve alone. MSB includes external benefits that are not reflected in private demand, so it is wrong to interpret a zero MSB as the price of the vaccine or the point where consumption naturally stops.*
 - *Failed to recognise that free provision by the government meant that the government sets the consumer price at zero and directly controls the quantity supplied. Free provision displaces the price mechanism altogether and does not respond to changes in price.*
- *Education and campaigns was better attempted than free provision. Nonetheless, some scripts:*
 - *incorrectly stated that government education should provide information about the external benefits of vaccines to third parties. This is misleading because consumers and producers act on self-interest and generally ignore or disregard the benefits their consumption provides to others. Instead, education should focus on the private benefits that accrue directly to consumers, such as reduced risk of illness, time saved caring for sick children, and avoidance of medical costs.*
 - *Failed to contextualise the thesis for education and campaigns by specifying how these campaigns should be conducted (e.g. indicate the media or channels like social media, posters, school programmes, community health booths), explain where the campaigns are targeted (e.g., schools, community centres, online platforms), identify target groups (e.g., parents of young children, caregivers, elderly who may undervalue vaccination) and explain why these groups are targeted, linking back to the economic reasoning (e.g. self-interest, correcting underestimated private benefits, increasing uptake).*
- *Since effectiveness as a yardstick of policy assessment has already been analysed in the thesis, then the anti-thesis ought to consider other yardsticks e.g. feasibility, sustainability and desirability.*
- *Students are encouraged to link their evaluation directly to each R1/R2 point before providing a concluding evaluation based on both Rs. Signpost evaluation clearly using phrases like “upon evaluation”, “after weighing both pros and cons”.*

*****END*****

“You never fail until you stop trying” ~ Albert Einstein