2024 JC1 H2 Economics
Final Examinations Revision Package
Suggested Answers

Section A: Case Study Questions

Question 1: Singapore's Grocery Retail Market (Source: 2019 SAJC Final Examinations)

Suggested Answers

(a)	**(i)**	**With reference to Figure 1, identify and explain the type of market structure operating in the Singapore grocery retail market.**	**[2]**
		Oligopoly. The 3 firm concentration ratio is 91%.	
(b)	**(ii)**	**Identify and explain one possible barrier to entry that may exist in the grocery retail market in Singapore.**	**[2]**
		1) Financial barriers Existing supermarkets e.g. FairPrice has large financial reserves for advertisements, partnerships with other companies such as Grab or even to engage in price war. Potential entrants must match FairPrice's financial reserves to engage in non-price and price competition against FairPrice. Inability to do so may prevent them from entering. **2) Cost barriers** Huge Capital Outlay/sunk costs and iEOS. To enter, potential entrants need to incur high sunk costs in the form of warehouses, shop spaces and delivery vehicles in order to set themselves up as a supermarket in Singapore. Any inability to bear such high costs, will prevent new firms from entering. Substantial iEOS: Potential entrants may not enjoy high iEOS. Hence, they may not be able to pass on any cost savings to consumers in terms of lower prices. This in turn mean that they may not be able to price their goods competitively and choose not to enter eventually. **3) Control of certain goods** Inability to negotiate contracts with sellers of certain goods e.g. essential agriculture products because existing supermarkets have already established long term contracts with sellers will find themselves unable to sell the agricultural products. New firms may not enter knowing that they are unable to offer products that meet consumers' needs.	

	(iii)	**Using Extracts 1 and 2, explain how the grocery retail firms in this market structure might compete with each other.**	**[4]**
		Mutual Interdependence between the small number of firms – i.e. high rival consciousness . Because of mutual interdependence, they may engage in price competition (and price wars) i.e. if a rival firm lowers price, they will have to also lower price. In addition to price competition, they may engage in non-price competition, particularly when firms choose to keep prices unchanged. **Price competition** E.g. • FairPrice engaged in price competition by reducing price of household essential items to match what its rivals do. • FairPrice partnered Grab to offer a new membership programme to allow members to enjoy rebates. **Non-price competition** • Sheng Siong Group launched rebate credit card to attract consumers to create convenience in payment • Partnership between NTUC and GRAB build brand loyalty schemes amongst its customers since members can enjoy member-exclusive events e.g. private movie screenings.	
(b)		**To what extent has the entry of e-commerce grocery retail firms like Redmart and Amazon affected the ability of an existing firm such as NTUC FairPrice to make large profits?**	**[8]**

Schematic Plan

Introduction:

Explain how an existing supermarket (a firm) have ability to make large profits.

- Oligopolistic market structure – Few large firms
- Substantial Market share → each firm faces high demand
- Can retain LR supernormal profits

Thesis: Entry of new firms has affected the ability of FairPrice to make large profits

Anti-Thesis: FairPrice's ability to make large profits has not been affected and could be even stronger

Market share eroded with entrance of e-commerce grocery firms.

- AR↓ due to market share being eroded. Greater choices PED >1
- Lower price and output at profit maximising point
- Smaller supernormal profits ; assuming no change in AC and MC

E-commerce only accounts for 15% of the market share

- Consumers still prefer shopping at typical supermarkets. Hence, no significant AR↓→ retain larger supernormal profit.
- Existing supermarkets still enjoy large iEOS (low AC). Hence able to pass cost saving to consumers in terms of lower price. New e-commerce firms cannot match price despite offering convenience.
- AR remain high but with a low AC → maintain ability to earn large profits

In LR, firms adopt strategies to counter the presence of e-commerce grocery firms

- Make stores more enticing → If successful, AR rise →Profits continues to be large if not larger
- Set up online stores too → If successful, AR rise→ Profits continues to be large, if not larger

Conclusion. It all depends on existing firms' ability to compete against e-commerce grocery stores by better meeting the consumers' taste and preference. Successfully meeting the changing consumers' taste and preferences will allow existing firms to retain its ability to earn large profits.

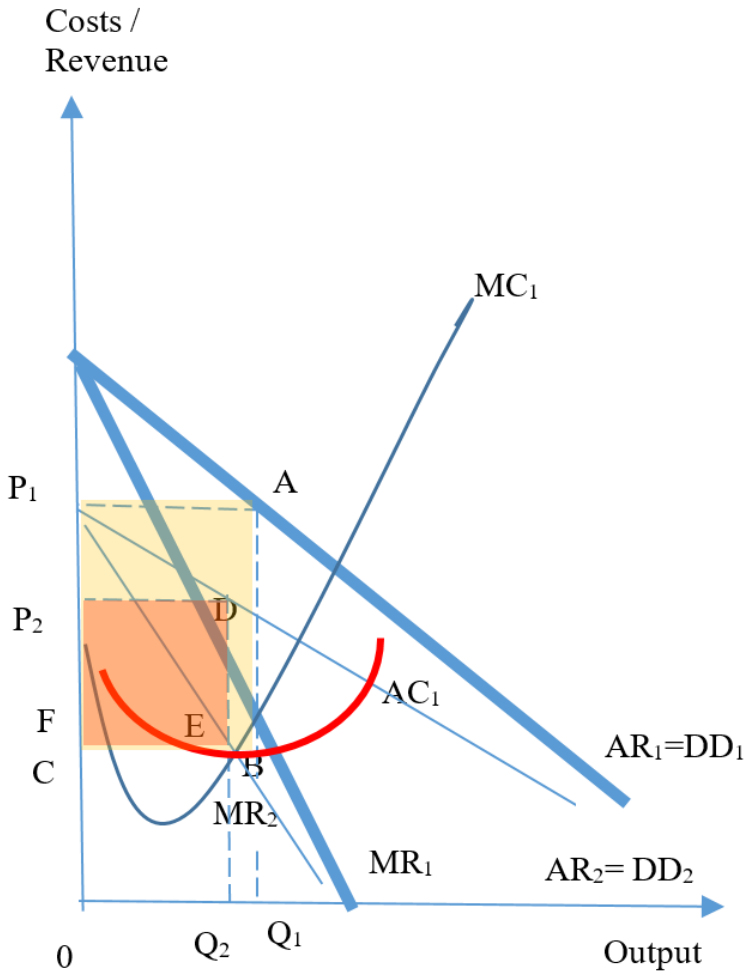
Introduction: Firms' objective is to produce and charge a price that maximises profit at MC=MR. Since supermarkets i.e. grocery industry falls under the oligopolistic market structure, they should be able to retain supernormal profits in the long run.

Thesis: The entry of e-commerce grocery stores might negatively affect FairPrice's ability to make large profits - FairPrice suffers a fall in Supernormal Profits

Initially, FairPrice is an oligopoly firm with 50% market share, it should be earning supernormal profits. However, as E-commerce firms such as RedMart and Amazon enter grocery industry to compete against FairPrice, this will reduce their market share and demand (i.e. AR/DD falls). This in turn reduce ability to earn large profits.

As a result of the fall in AR/DD, supernormal profits should fall. From the diagram below, AR falls from AR_1 to AR_2, together with MR from MR_1 to MR_2. The profit maximising price and output will be P_2 and Q_2 respectively. In addition, there is lower ability to reap iEOS at Q_2 than at Q_1. Therefore AC rises.

Given AR falls and AC rises, average profit will fall. Total revenue falls from $0P_1AQ_1$ to $0P_2DQ_2$, and supernormal profits fall from P_1ABC to P_2DEF.



Anti-Thesis: The entry of e-commerce grocery stores might not affect FairPrice's ability to make large profits

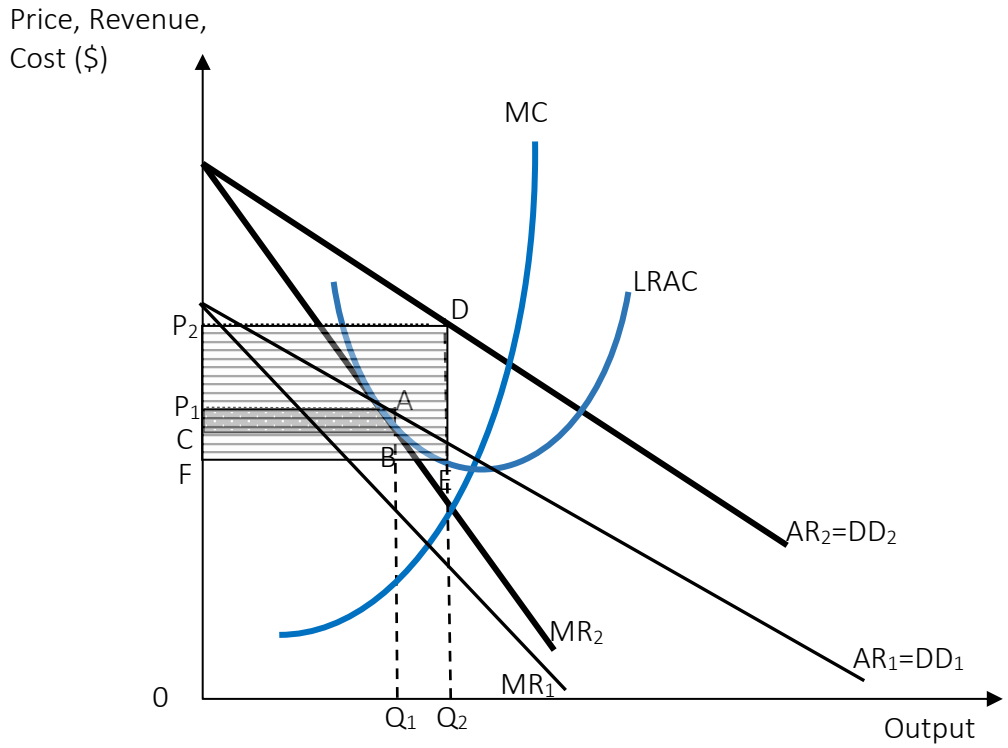
Although "More and more Singaporeans, especially digital natives and busy PMEBs[1] prefer the convenience of shopping online", there is still a substantial segment of customers who prefer to buy from traditional supermarkets, such as non-digital natives, elderly and students who do not have the means to make online purchases. In fact, online sales still account for less than 15 per cent of overall supermarket sales, which means that the bulk of supermarket sales still comes from purchases made at FairPrice's physical stores. This means that ability to make large profits will not be negatively affected significantly.

In addition, to retain their ability to earn large profit, FairPrice could also revamp themselves to meet the taste and preferences of digital natives. From the extracts, FairPrice could revamp by setting up online stores, promising same day delivery, making stores more enticing by offering one-stop services e.g. integrated health and wellness concept that has everything you need to live, feel, look and eat well. These will entice more consumers to visit their physical stores.

These strategies may help FairPrice to avoid a fall in AR/DD or even may even increase. If brand loyalty is established, value of PED will even fall. From the diagram below, AR increases from AR_1 to AR_2, together with MR from MR_1 to MR_2. The profit maximising price and output will be P_2 and Q_2 respectively. In addition, there is greater ability to reap iEOS at Q_2 than at Q_1. Therefore, a movement along the LRAC **(this could also be represented with a shift of the SRAC curve downwards to represent lower SRAC in the short run).**

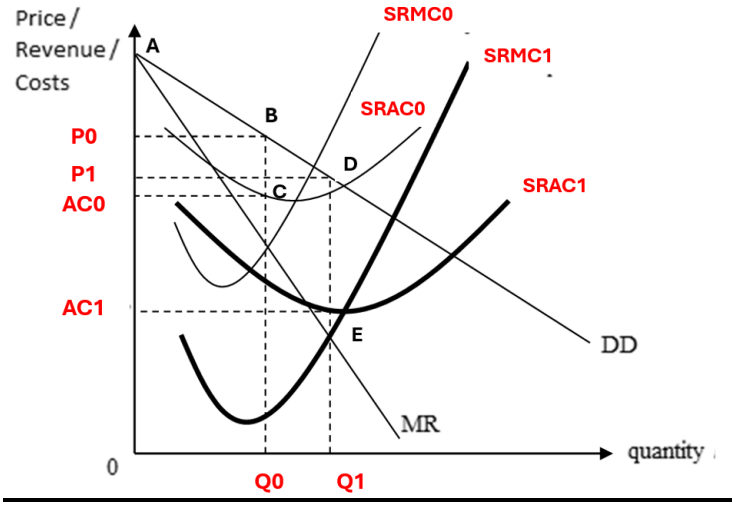
Given AR increases and AC falls, average profit will increase. Total profit falls from $0P_1AQ_1$ to $0P_2DQ_2$, and supernormal profits increase from P_1ABC to P_2DEF.

Movement along LRAC curve (IEOS)



[1] **PMEB** stands for Professionals, Managers, Executives and Businessmen

Shift of the SRMC & SRAC curve (IEOS)



Conclusion/evaluation:

Whether ability to earn large profits will be affected or not depends on

1) The success of the strategies or revamp implemented by FairPrice
   Profits may still fall because the strategies are not successfully implemented by FairPrice
   OR
   Profits may not fall or may rise because the strategies are successfully implemented by FairPrice because the online store is equally competitive or the physical stores have greater appeal or festivals created are interesting and novel.

2) Receptiveness of FairPrice's customers and Singapore consumers towards FairPrice's new offerings. Some consumers may still prefer the newer stores because of the novel offerings of products by Redmart and Amazon.
   Profits may still fall because more Singaporeans are tech savvy and prefer the newer product offerings by Redmart and Amazon.
   OR
   Profits may not fall or may rise because more Singaporean consumers are loyal to the brand name established by FairPrice especially the older consumers. But overtime, FairPrice may continue to see their profits and market share eroded if younger consumers continue to be attracted by Redmart and Amazon.

3) Strategies implemented by Redmart and Amazon to retaliate
   Redmart and Amazon could have used non-price strategies to retaliate and attract consumers. They can make use of more attractive options and wider variety of products, e.g. Amazon Prime. They could tie up with more firms or more countries to source their products, e.g. USA or Japan, as this could attract consumers to make purchases from FairPrice. Hence FairPrice's profits may still fall.

Level	Descriptors

		2	A well elaborated answer that is i) 2 sided exploring both possibility of a fall / rise in ability to earn large profits ii) Provides some information from the extracts iii) Uses Cost/Revenue analysis e.g. shifts in AR
		1	A superficial answer or an answer that is one-sided. Answers could be poorly written or structured or with a poor flow or lacking in clear direction. Answer might have tried to use an inappropriate framework like demand and supply.
		E2	Stand made with economic justification based on the Singaporean grocery market context.
		E1	Stand made without any relevant economic justification or poor justification
(c)		**With reference to Extract 4:**	
	(i)	**Explain briefly, two reasons to justify government intervention to reduce the use of plastic bags in Singapore.**	**[4]**
		The government intervenes in the market for plastic bags because of Market Failure. There could be 2 sources of market failure which lead to inefficient resource allocation i.e. over consumption of plastic bags. The first source is negative externalities in consumption of plastic bags. Disposing plastic bag contributes to environmental damages, such as litter, threats to wildlife and floods. These are externalities that result in costs which third parties have to bear. E.g flooding due to clogging waterways leads to loss/damage of properties; and polluted waterways can reduce income of farmers or fishermen due less ability to farm and to fish. Reducing use of plastic bags will reduce the number of disposed plastic bags causing environmental damages. The second source is imperfect information such as the underestimation of the private cost of consuming plastic bags. Studies show that there could be long-term damages to consumers' own health as micro plastics find their way into consumers' food and water, and get ingested. Unawareness of how use of plastic bags can result in future health issues cause consumers to over use plastic bags.	
(c)	**(ii)**	**Discuss whether imposing a tax is the best way to reduce the use of plastic bags in Singapore.**	

Schematic Plan

Introduction:
- Objective of government policy is to achieve allocative efficiency
- Which is to reduce the consumption level to the social optimal level

Thesis: Imposing a tax is the best way to reduce the use of plastic bags in Singapore

Anti-Thesis: Imposing a tax is **not** the best way to reduce the use of plastic bags in Singapore

Effectiveness of a Tax to reduce use of plastic bags.
- Assume tax = MEC
- Raise MPC
- Reduce consumption to a more socially optimal level
- However difficult to measure the amount of tax

Effectiveness of Banning use of plastic bags
- Might be better than a ban as a ban is not practical and result in greater deadweight loss (diagram)

Effectiveness of Bring Your Own (BYO) Campaign
- Reduces demand or MPB of using plastic bags
- Reduces the overconsumption of plastic bags to a more socially optimal level
- However, there are problems of contamination etc

Effectiveness of increasing public awareness through education
- Education to increase $MPC_{perceived}$ closer to MPC_{true}.
- private level of plastic consumption will be reduced to a more socially optimal level

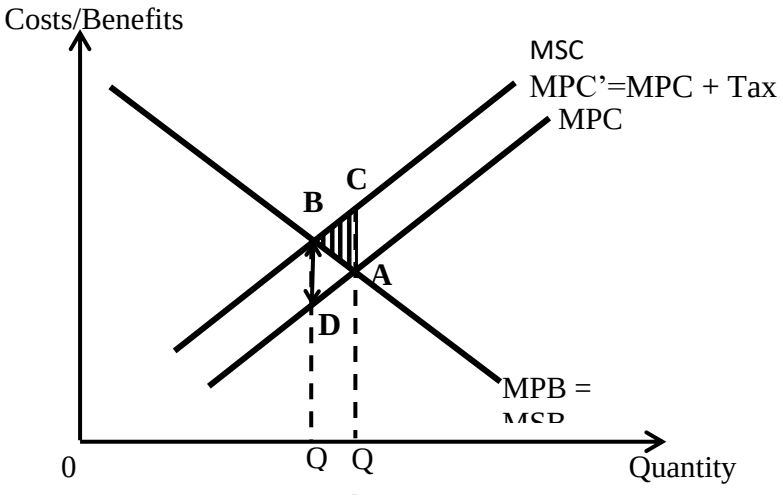
Conclusion/Evaluation. Given that each policy has its own limitations, government can use a combination of policies such as tax and BYO campaign, while running public campaigns at the same time.

Introduction:

An objective of the government is to achieve allocative efficiency. Given the overconsumption of plastic bags in Singapore, the aim of any policy is to reduce the consumption level to the social optimal level. As such, there will be no deadweight loss and there will be allocative efficiency.

Effectiveness of a Tax to reduce use of plastic bags

Referring to the diagram below, a tax per unit equal to the MEC at $0Q_S$ could be implemented on each unit of plastic bag use. As a result of the higher cost of using a plastic bag, MPC is raised to MPC' as the consumer is forced to internalise the external cost that he generates. The consumer now bears the external cost and will respond by reducing the output level to $0Q_S$ units as he seeks to equate MPC' (MPC+ Tax) which coincides with the MSC and MPB (=MSB). Hence, socially optimum level of production, OQs, is achieved now that MSC=MSB.



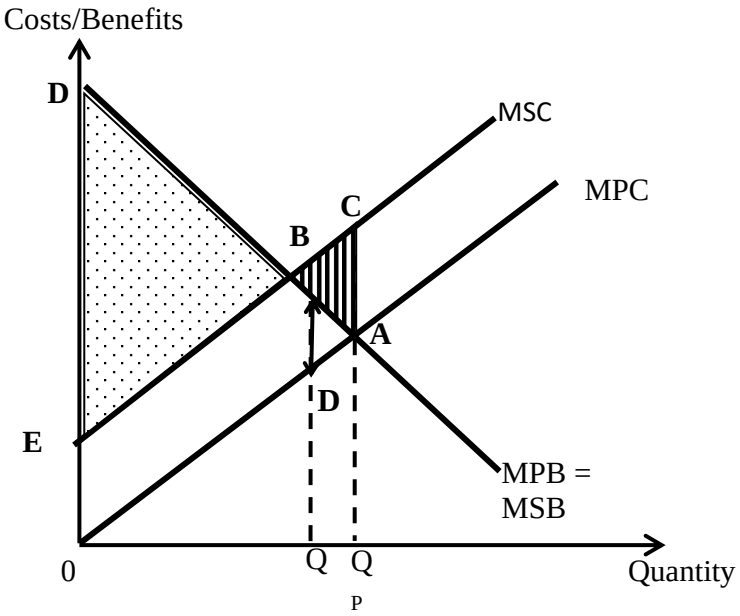
Ideally, with the imposition of a tax, the problem of over-consumption and deadweight loss is completely eliminated. The policy implementation is relatively easy as not much monitoring is required. In addition, the tax revenue collected can be used to finance government projects such as public education or campaigns that helps to reduce the use of plastic bags.

However, from extract 4, "Those living in HDBs need to use plastic bags to dispose of their waste". Hence, the demand for plastic bags is price inelastic because it is useful and necessary in disposing waste of those living in HDB. Therefore, the amount of tax may end up to be very high to correct the market failure. In addition, high tax per unit of plastic bags may result in inequity, especially for low income households as the tax takes up a larger proportion of their income. Hygiene levels may also fall as people use alternatives such as reusable bags to carry fresh produce.

Effectiveness of Banning use of plastic bags

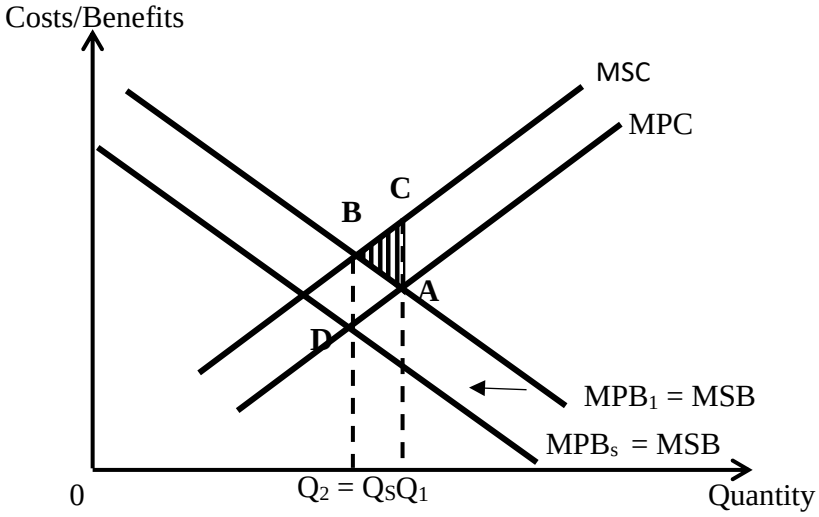
Nonetheless, it may still be a better choice than banning the use of plastic bags. As mentioned in the extract that "banning plastic bags completely in supermarkets is not practical and could cause problems elsewhere. Paper for wrapping can tear easily and hygiene could be compromised". This means that the banning of plastic bags may result in greater deadweight loss.

As seen in the diagram below, if plastic ban is banned, the welfare loss equal to the deadweight loss of area DEB is much greater than the deadweight loss of area ABC. This means that banning creates greater allocative inefficiency.



Effectiveness of Bring Your Own (BYO) Campaign

BYO campaign aims to reduce the use of plastic bags by offering consumers cost savings on grocery. Referring to the diagram below, the BYO campaign helps to reduce the demand for plastics by consumers in Singapore. It can result in a leftward shift of the MPB from MPB_1 to MPB_2, and as a result, the free market equilibrium has changed from MPB_1=MPC (point A) to MPB_2=MPC (point D) and a fall in consumption from Q_1 to Q_2. This reduces the overconsumption of plastic bags to a more socially optimal level at 0Qs.



However, as mentioned in extract, by bringing their own bags can also result in contamination, especially when people do not wash their bags often, which is also at the expense of water resources.

Effectiveness of increasing public awareness through education

Given that consumers may have underestimated the MPC of using each unit of plastic, increasing awareness of the ill-effects of using plastic on self could be another a solution. Education could inform consumers how excessive use of plastic may result in increasing the chance of ingesting microplastics as plastics break down and enter the human food chain. Ingestion of microplastic may result in potential health risk. Such education seek to increase $MPC_{perceived}$ and shift it closer to MPC_{true}. As such the private level of plastic consumption will be reduced to Q_s.

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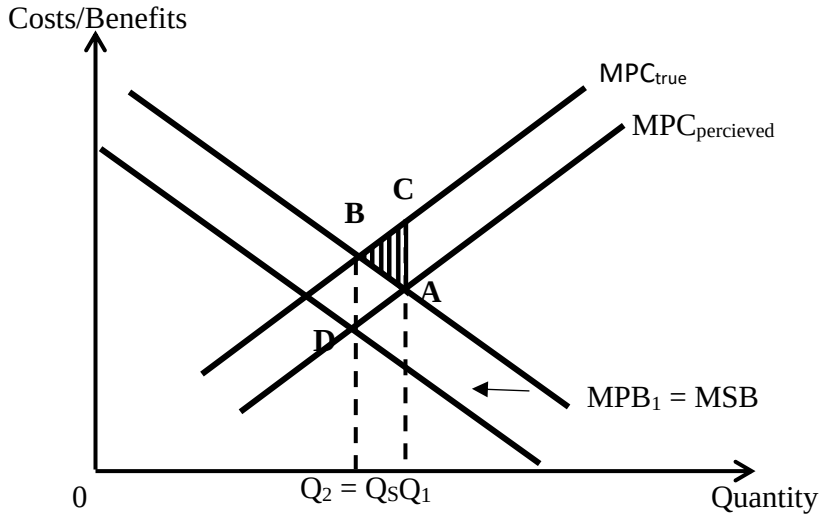


Evaluation

Comparison of measures in terms of allocative efficiency

- Banning is the least effective as it creates even more allocative inefficiency.
- Ideally, consumers should reduce the use of plastic bags willingly. Hence, public education to increase awareness of the true marginal private cost of plastic bags and in turn reduce the use of plastic bags should be most desired. This is especially effective if the more serious root cause is due to imperfect information. However, success of education usually takes time given that behaviour could prove hard to change.
- Similarly, BYO campaign are not compulsory. Some Singaporeans may not feel obliged to change their habits.
- Despite limitations of tax, consumers are more likely to reduce the overconsumption with immediate effect as a result of the tax increasing the MPC. Yet, if tax is not high enough, especially given that the demand for plastic bag is price inelastic, many people are still able to afford it since it currently takes up only a small portion of people's income. Perhaps the tax should be much higher to further reduce the allocative inefficiency.

Given that each policy has its own limitations, government can use a combination of policies such as tax and BYO campaign, while running public campaigns at the same time.

Level	Descriptor
L2	• Well-developed answer with discussion of at least 2 policies • Provided explanation of a tax and one other measure. • Used evidence from the case study to provide explanation • Used cost-benefit analysis to show how the problem of overconsumption is solved, i.e. how MPC shifts leftwards • Good application to context of plastic bags used in Singapore • Examine how market failure or overconsumption of plastic bags is solved.
L1	• Undeveloped answer (mere stating/description of policies) without diagrammatic analysis or links to how market failure is resolved
E2	• Sound comparisons of policies. • Judgment whether tax is the best policies with support.
E1	Vague and superficial evaluative comment

Question 2: The Alcoholic Beverage Industry in Vietnam (Source: 2020 SAJC Final Examinations)

Suggested Answers

(a)	**(i)**	**Describe the trend of alcohol consumption in Vietnam from 2010 to 2019.**	**[1]**
		Alcohol consumption has increased from 2010 to 2019.	
	(ii)	**Explain one possible reason for the trend observed in ai).**	**[2]**
		(Any plausible reason to explain an increase in demand for alcohol or an increase in supply is accepted) **Identification of 1 demand/supply factor [1m]** **Explanation to link to higher consumption of alcohol[1m]** **Demand Factors** Higher demand due to economic growth → Higher purchasing power, greater willingness and ability to purchase goods and services. Assuming alcohol is a normal good, demand increases, ceteris paribus. This leads to higher consumption of alcohol. Advertising done by firms → influence consumers' taste and preferences →Higher demand, ceteris paribus. This leads to higher consumption of alcohol. Improvement in quality of products provided by firm, e.g unique drinks. → influence consumers' taste and preferences →Higher demand, ceteris paribus. This leads to higher consumption of alcohol. **Supply factor** A fall in cost of production would lead to an increase in supply, ceteris paribus. This leads to higher consumption of alcohol.	
(b)	**(i)**	**With reference to Extract 1, explain one reason why there is a need for government intervention in the market for alcoholic beverages.**	**[4]**
		Explain how negative externalities OR imperfect information leads to market failure **Government will intervene due to negative externalities** • Government will need to intervene due to negative externalities generated by the consumption of alcohol. • Negative externalities refer to external costs which are imposed on a third party and is not taken into account by the producers or consumers of the good. • The external costs of alcohol consumption would be the loss in productivity of workforce, leading to a fall in economic growth for the economy. This would be the result of health	

		problems caused by prolonged consumption of alcohol (Evidence from Extract 1). • The external costs lead to a divergence between MPC and marginal social cost (MSC). • Consumers aim to maximise their utility, and consume where marginal private cost (MPC) = marginal private benefit (MPB). MPC refers to the additional cost incurred from purchasing an additional unit of alcoholic drink while MPB refers to the additional satisfaction from consuming an additional unit of alcoholic drink. • The socially optimal outcome is at MSB=MSC, where society's welfare is maximised. • There will be over-consumption of alcohol if it is left to the free market, leading to a welfare loss. Hence, there is a need for government intervention. **OR** **Government will intervene due to imperfect information** • Government will need to intervene due to imperfect information in the consumption of alcohol. • Due to imperfect information, consumers are not fully aware of the true costs of consumption of alcohol. They might not be fully aware of the negative effects of prolonged alcohol consumption on their health, such as the impact on their liver and kidneys, as mentioned in Extract 1. • Hence, due to imperfect information about the potential risks of excessive sugar intake, there is a divergence between the perceived MPC and true MPC. MPCperceived < MPCtrue. • Consumers aim to maximise their utility, and consume where marginal private benefit(MPB) = MPCperceived. • The socially optimal outcome however is at MSB=MSC, where society's welfare is maximised. • There will be over-consumption of alcohol if it is left to the free market, leading to a welfare loss. Hence, there is a need for government intervention.	
(b)	**(ii)**	**Explain how a tax on alcohol would help to "control the harmful effects of alcohol" (Extract 1).**	**[3]**
		A tax has an effect similar to an increase in cost of production. This leads to higher marginal private costs as consumers would be forced to internalise the external costs. Consumers will then reduce their consumption of alcohol where marginal private benefit = marginal private costs (including tax).	
(c)		**Identify the type of market structure in the alcoholic beverage industry in Vietnam. Justify your answer.**	**[2]**

		• Oligopoly • A few large firms dominate the market for alcoholic beverages in Vietnam, with the top 3 firms taking up 83% of the total market share, as shown in Figure 2.	
(d)		**Suppose a firm decides to enter the alcoholic beverage market in Vietnam. Assess whether this decision is a rational one.**	**[8]**
		Question Analysis **Command word(s):** Assess whether **Content:** Factors influencing rational decision making **Context:** Firm's decision to enter the market for alcoholic beverages in Vietnam **Schematic Plan** **Intro** Outline the objective of firms and factors affecting a firm's decision **Body** Factor #1 – Benefits Revenue to the firm Factor #2 – Costs Costs of production Factor #3 – Constraints/Information - Budget constraints of a firm - Gather information **Conclusion** Weighing of whether it is a rational decision or not **Introduction** • Assuming that a firm aims to maximise profits, in the long run, firms aim to make at least normal profits, when total revenue = total cost. • Therefore, in order to decide whether to enter the industry, a firm would use the rational decision-making framework to identify the costs and benefits, as well as consider other factors such as constraints and information. **Body (Benefits)** • The firm would consider the benefits of entering the alcoholic beverage market, which is the revenue that it can earn from the sales. • The firm should enter the industry due to the large market potential in Vietnam. This is due to several reasons such as the increase in alcohol consumption as shown in Figure 1. With a big population of 100 million people (as mentioned in Extract 2), this would also mean a large potential pool of customers to sell the	

product to. Therefore, the firm could potentially earn high revenue from the sales of alcohol in Vietnam.

Body (Costs)

- The firm would consider the costs involved in the production of alcohol. This would involve costs of production such as purchase of ingredients to make the alcoholic beverages, cost of labour, advertising and cost of building the necessary infrastructure such as offices and production facilities.
- Dominant firms might be able to enjoy internal economies of scale due to the larger scale of production. Internal economies of scale refers to a fall in unit cost of production when a firm expands its scale of production. As stated in Extract 2 and Figure 2, the alcoholic beverage market in Vietnam is dominated by a few large firms. A new entrant could face higher costs due to its lower scale of production.

BODY (Constraints/ Information)

Constraints

- The firm might also consider the constraints involved, such as whether it is able to attain the necessary licences (as mentioned in Extract 2) to operate a beer factory in Vietnam. Inability to attain the relevant licenses would mean the firm is unable to enter the industry.
- The firm would also need to consider other constraints such as availability of budget to spend on advertising to enable it to compete in the market.

Information

- The firm might also gather information about other matters which could affect its decision, such as changes in the market trends for alcohol and consumption patterns. This would help provide it with more information to make a rational decision.

Conclusion

Overall, the firm should enter the industry if it feels that the potential benefits would outweigh the potential costs. If the benefits outweigh the costs, it is a rational decision to enter the alcoholic beverage market in Vietnam. If costs outweigh the benefits, it is not a rational decision. If government regulation is effective in curbing the consumption of alcohol, this would greatly limit the firm's revenue and profits, limiting the firms' benefits. Therefore, the firm might not choose to enter the industry.

Mark Scheme:

Level 2 (4-6)	• For 6m: Well-developed answer which considers costs, benefits and one other factor of the rational decision making framework. Answer demonstrates good knowledge of the context.

			• For 4 to 5m: Answer which considers costs and benefits of the rational decision making framework. Some gaps in explanation and/or minimal reference made to context.
		Level 1 (1-3)	• For 3m Answer considers costs and/or benefits and/or one other factor of the rational decision making framework. Significant gaps in explanation or significant conceptual errors. • For 1-2m Smattering of points without clear links to the rational decision making framework.
		E2	Judgement supported with reason
		E1	Unexplained judgement on whether it is a rational decision
(e)		**Assess the effectiveness of various strategies a firm selling alcoholic beverages could use to increase its profits.**	**[10]**

Question Analysis

Command:	Assess
Content:	- Price strategies - Non-price strategies - Strategies to Reduce Cost
Context:	Market for alcoholic beverages

Schematic Plan

Intro Outline the various strategies a firm could use to increase its profits		
Body		
Price Strategies	Non-Price Strategies	Strategy to Reduce Cost
• Lower prices to increase total revenue	• Product differentiation • Provide additional services	• Merger to reap internal economies of scale
Conclusion Overall stand regarding which strategy is most effective, given the context		

Introduction

Overall, firms aim to maximise profits. Therefore, firms can use price and non-price strategies to increase revenue and strategies to reduce cost.

Body

Firms can use pricing strategy to increase its profits

- Firms can use pricing strategy to increase its total revenue. Demand for a firm's product is likely price-elastic (due to availability of substitutes from other competitors selling alcoholic beverages). Therefore, the firm should lower prices to increase its total revenue. A fall in price would lead to a more than proportionate increase in quantity demanded, ceteris paribus.

This would lead to higher total revenue for the firm. Assuming costs are constant, this would lead to higher profits for the firm.

- However, given the context of an oligopolistic market, firms might choose not to compete based on price. Due to the mutual interdependence in an oligopoly, rival firms will match each other's price reductions but not price increases. Therefore, prices are rigid in an oligopoly.

Non-price strategies

Firms can engage in product differentiation to increase its profits

- Firms can engage in product innovation to increase its total revenue. Firms could spend on research and development to improve quality of product or create new products, such as the introduction of new and unique flavours such as lychee and strawberry in alcoholic beverages, as mentioned in Extract 3.

  This would lead to an increase in demand, and the demand curve for the firm's products will shift to the right, ceteris paribus. This would lead to higher revenue for the firm. Holding all else constant, this would lead to higher profits for the firm. Through product innovation, demand demand also becomes relatively price-inelastic. This gives the firm more market power to charge a higher price in the future without suffering a substantial fall in its market share.

  However, the final impact on profits would depend on the extent of increase in revenue relative to costs.

Firms can provide additional services to increase its profits

- Firms could also provide additional services such as home delivery of the alcoholic beverages, as mentioned in Extract 3. This would provide more convenience for consumers and lead to an increase in demand for the firm's products. The demand curve for the firm's products will shift to the right, ceteris paribus, and this would lead to higher revenue for the firm.

  This would lead to an increase in demand, and the demand curve for the firm's products will shift to the right, ceteris paribus. This would lead to higher revenue for the firm. Holding all else constant, this would lead to higher profits for the firm. Through providing additional services, demand also becomes relatively price-inelastic. This gives the firm more market power to charge a higher price in the future without suffering a substantial fall in its market share.

  However, the final impact on profits would depend on the extent of increase in revenue relative to costs. For a large country, this could also present difficulties in implementing a delivery service,

due to logistical challenges as mentioned in Extract 3. This could lead to high costs in implementing such a strategy.

Strategy to reduce Costs

Firms can merge with another firm to increase its profits

- Firms can also undertake a merger with another firm to reap internal economies of scale. Internal economies of scale refers to a fall in unit costs of production when a firm expands its scale of production. With the merger, the firm would now expand its scale of production. Through greater bulk-buying of raw materials, this would lead to lower average costs for the firm.
- Holding revenue constant, lower costs would lead to an increase in profits for the firm.
- However, the effectiveness of this strategy depends on the extent of economies of scale to be reaped.

Conclusion

In conclusion, non-price strategies such as product differentiation is likely to be most effective in enabling a firm to increase its profits. Given the context of an oligopolistic market, it is likely that firms would not compete based on price. The effectiveness of a merger in leading to higher profits would also depend on the amount of economies of scale to be reaped. It is likely more useful for a small firm compared to a large firm.

Mark Scheme:

Level 2 (5-7)	For 7m: • Well-developed explanation of 2 possible strategies a firm can use to increase its profits. Answer demonstrates good understanding of the context. • Clear links made to revenue and costs • Arguments are presented in a precise, logical and reasoned manner (an analytic explanation) • Reasoned (analytic) structure to the whole answer For 5-6m: • Good explanation of 2 possible strategies a firm can use to increase its profits, with some gaps in explanation • Some effort to make links to the context • Organisation of ideas may not be coherent Cap at 5m: Theoretical answer with no effort to make links to the context Answer is lacking in scope, with only non-price strategies OR price strategies OR strategies to reduce cost being covered
Level 1 (1-4)	3-4m • Answer shows little knowledge of strategies to increase a firm's profits. Lack of details in explanation.

			• Answer contains significant conceptual errors. 1-2m • Answer is mostly irrelevant or inaccurate	
		E2 (2-3)	Judgement supported with reason	
		E1 (1)	Unexplained judgement regarding which strategy is most effective	

Question 3: The Pharmaceutical Industry
(Source: 2021 SAJC Final Examinations)

(a)	**i**	**Explain one measure used by economists to assess the level of competition in an industry.**	**[2]**
		• Market concentration ratio Follow by explanation on either of the following: • The higher the concentration ratio, the lower the level of competition, • The higher the concentration ratio, the higher the level of market dominance • The higher the concentration ratio, the more monopolistic or oligopolistic the market is	
		Markers' Comments • Weaker answers used BTE or number of firms or PED/XED. Those who only mentioned market share of individual firm missed the key idea that it is the combined market shares of the top few firms in a market that determines the level of competition. • Stronger answers used concentration ratio to show how theoretically economists measure competition, thereby showing the correlation between concentration ratio and level of competition	

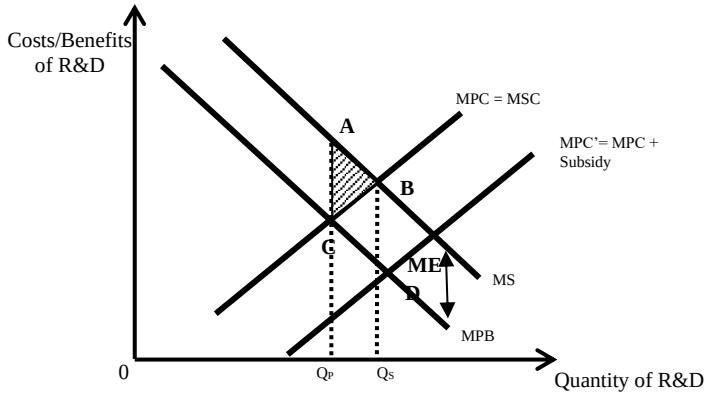
	ii	***"Nearly all the drug companies raised their prices, but kept their price increases at 10 per cent or below."*** **Using Figure 1 and Extract 1, explain why such pricing behaviour happens in the pharmaceutical industry.**	**[4]**

The pharmaceutical industry is an **oligopoly** due to **high 8 firm concentration ratio** (50%)	
Firms are **mutually interdependent** or has high **rival consciousness**.	
Firms compete but **rarely/ do not use price competition**.	Oligopolistic firms can collude to act like a monopoly (**cartel**) or collude tacitly by following the price leader (**price leadership**)
They will all keep their price increase to 10% --> which suggests **some level of price rigidity**. Or They avoid price war because **they lose when they lower prices** (as other firms follow suit) **or raise prices** (as others don't follow and lose TR)	The above is a case of **formal /tacit collusion** where firms set higher prices together

		Markers' Comments • Weaker answers did not understand the concept of mutual interdependence. Some even used price mechanism to answer this question. Some answers even identified the market as monopolistic competition, and suggested that price increases were due to firms' desire to do R&D which did not show an understanding rival consciousness. • Some answers showed understanding of rival consciousness but did not go further into how these firms set prices by following the price leader or by explaining price rigidity. • Some confusion occurred when answers mixed up collusion with competition. E.g. collusion does not result in price rigidity, likewise, competition does not result in price leadership.	

		• Stronger answers tend to understand that mutual interdependence is the key behaviour behind an oligopoly and thus the similar price increases is due to this behaviour. These answers also tend to use the concentration ratio in part (i) to state that this market is oligopolistic in nature.	
(b)	**(i)**	**Explain the effect of patent expiration on the PED value of original drugs.** Expiry means generic drugs will enter the market to compete resulting in **more competition** or firms in the market, thereby **increasing the availability of substitutes** to the original drug. This will **increase PED value**	**[3]**
		Markers' Comments • This question is fairly well done. Most students were able to state that patent expiration led to increase availability of substitutes. ○ More accurately patent is deemed as a barrier to entry. Hence a patent expiration will *result in more competition follow by greater availability of substitutes.* • There were a minority who did not understand what patent is. This led to answers that were irrelevant.	
	(ii)	**Given the relationship that exists between price elasticity of demand (PED) and total revenue, explain what pricing strategy the producer of an original drug should adopt to increase total revenue.**	**[3]**
		From (i), since absolute PED value increases, assume |PED|>1 The producer of an original drug would decrease the price. The fall in price of original drug results in a more than proportionate increase in the quantity demanded hence increase TR Total revenue would increase as the increase in revenue due to the increase in quantity demanded is more than the decrease in revenue due to the fall in price.	

		Markers' Comments • This question was fairly well done. Responses were able to show the relationship between PED and TR. • Many students drew the diagram, and did so correctly. • The strongest responses recognized the context of patent expiring in their explanation; and provided a response that was beyond a mere rehearsed theoretical explanation ○ do note that (bi) and (bii) should be seen as one question.	

(c)		**Discuss whether the US government's plan of using public funding to deal with the underproduction of R&D will be effective. [8]**
		
		<u>Reason for Public Funding</u>
		• Public funding is a form of government intervention to help producer **internalise the external benefits from** producing R&D to deal with the Covid-19 pandemic.
		  ○ **Example of external benefits** include 3rd party firms using the newly discovered knowledge to produce new drugs
		• If left to the free market, due to **divergence between MPB and MSC given the positive externalities,** the development of new drugs will be at **$0Q_P$ where MPC=MPB** in Fig. 1.
		  ○ This is because the pharmaceutical firm motivated by self-interest will produce up to the point where Marginal Private Benefit (MPB) = Marginal Private Cost (MPC).
		  ○ Hence, $0Q_P$ represents the market equilibrium level of production.
		  ○ Therefore from society's point of view, at $0Q_P$, the cancer-related R&D is under-produced.
		• Socially optimal outcome is at **Qs where MSB=MSC**
		• There is **underproduction of R&D since Qp < Qs** will be a welfare/deadweight loss of area ABC as a result of the under-production by QPQS
		
		 
		
			[8]

Effects of Public Funding

- To correct the under-production of and therefore under-allocation of resources to R&D, the government provides "funding".
- Assuming the "funding" is equivalent to a subsidy of the R&D process, the **government provides a per unit subsidy that is equal to the marginal external benefits at $0Q_S$** which is the social optimal output where MSB = MSC.
- This will shift the MPC curve by BD to the MPC' curve, where MPC'= MPC + Subsidy. **With the subsidy, the producers' cost of production would fall from MPC to MPC'.** Producers now produce OQs amount of output where MPB = MPC'. This production **level coincides with the socially optimal level of output, i.e. $0Q_S$ where MPC' = MPB.**
- The deadweight loss of ABC is eliminated. As a result, resources are efficiently allocated and society's welfare is maximised.

Effectiveness of Public Funding

- Subsidy helps to speed up the R&D process as most producers would not have been able to develop their jabs as quickly without substantial injections of funding (from Extract 3)
- Although such a measure can help to achieve the allocatively efficient level of output, it is **difficult to estimate the amount of subsidy** to be provided as it is difficult to accurately measure the marginal external benefits (textbook answer).

Evaluation

- **Judgement**: The use of public funding is generally effective
- **Substantiation:** This helps to speed up the R&D process which would otherwise be prolonged. It is important as countries are struggling to contain the spread of the virus and vaccination is one effective way to improve the situation.

Mark Scheme

Level	Knowledge, Understanding, Application and Analysis
L2 (4 – 6)	Well-explained, well-developed, made reference to context and **how public funding will help to correct the market failure** due to underproduction of R&D. Accurate application of MSB-MSC analysis
L1 (1 – 3)	Combination of • Answers are too brief and sketchy • Unclear explanation and concepts • No contextual evidence • Grave conceptual errors
Evaluation	
E2 – 2	Reasoned judgement with criteria – 2m

		E1 – 1 Judgement without reasons or with unclear criteria Mere conclusion	

		Markers' Comments
		
		• This question requires students to identify and explain that production of R&D leads to positive externalities before evaluating the effectiveness of public funding in correcting the under-production of R&D. Explaining the market failure sets the stage to explain how well public funding will work to increase production of R&D.
		• Many students did not recognize or explain the source of market failure.
		• Very weak answers did not realise this was a question on market failure and attempted to answer this question using DD/SS diagram or MR-MC diagram. In fact, some students mistook "under-production of R&D" as a "shortage of R&D" and attempted to use demand/ supply concepts to explain. Under-production of R&D implies there is a market failure as the social optimal amount is not produced. It is different from a "shortage of the good" in the market (disequilibrium).
		• Public funding is another term for government funding which has the effect of giving subsidies to the firms. Some students mistook public funding as getting funds from the public instead of the government.
		• Students' explanations of market failure were generally lacking as they did not know how to make their answers concise without neglecting the main points.
		  ○ Very few students were able to explain that positive externalities in the form of shared knowledge with other firms who did not conduct R&D has benefited these firms as they can use the knowledge for greater advancements in vaccines or developing other medicines.
		  ○ Students wrote R&D is a merit good. R&D is not a merit good as it is under-produced not under-consumed when left to the free market.
		  ○ A minority did not identify the divergence in MSB and MPB or drew the correct curves. Area of deadweight loss was also shaded incorrectly.
		• A significant number of students incorrectly identified the market as the market for vaccines.	

(d) **Assess whether Viatris, the merged company between Pfizer's Upjohn unit and Mylan, will on balance, benefit consumers and producers.** **[10]**

	Gains	Losses
Consumers	EOS resulting in lower prices	increased market share resulting in higher prices
Producers (merged firm Viatris)	EOS resulting in lower AC. Higher profits	
Other producers		Lower market share, increased competition

Introduction

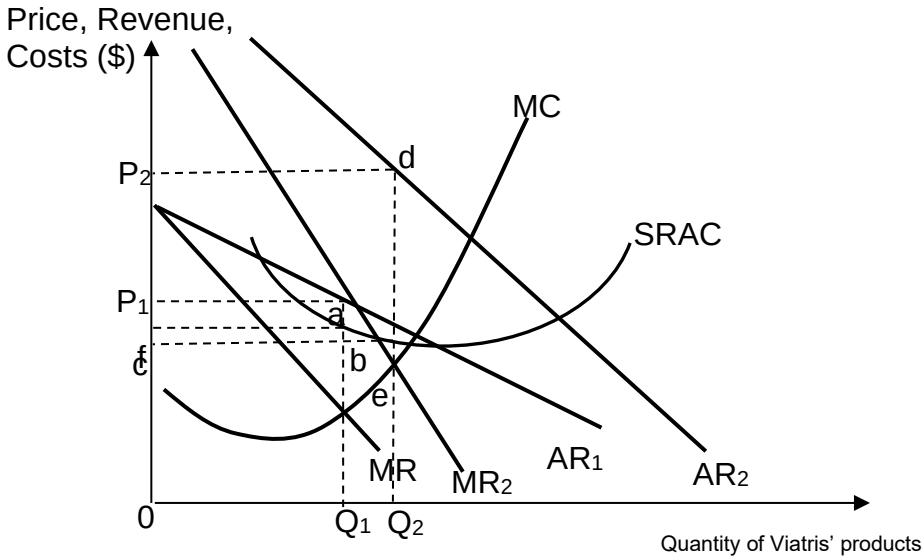
- Merger is vertical merger
- Impact on consumers in terms of prices and choice
- Impact on Viatris in terms of cost (EOS), revenue or profits
- Impact on society in terms of allocative or dynamic efficiency

Body

Gains and Losses for Viatris

Gains from higher TR and profits

- When Pfizer and Mylan merged, they would have an increased market share.
- Demand for the Viatris' products would increase as Mylan would be able to sell products in Pfizer's established markets (extract 4).This will result in higher total revenue. As a result, profits will increase.

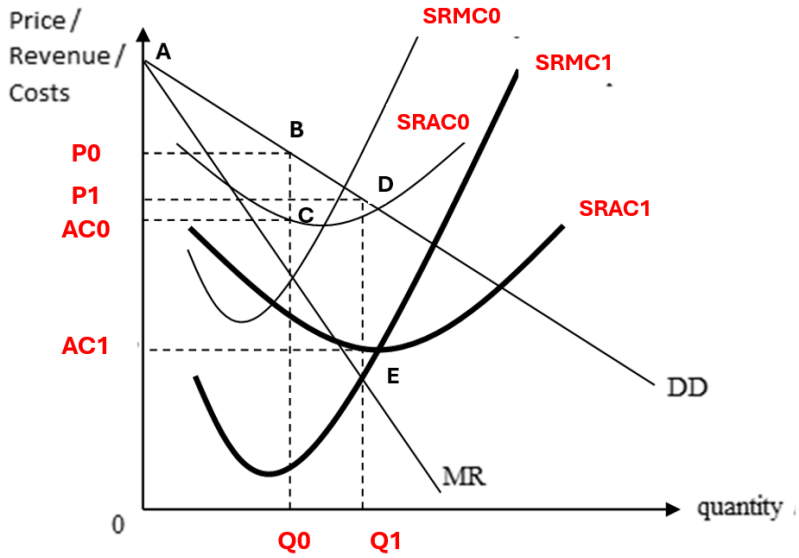


- From the above diagram, DD for the merged firm Viatris rises from DD_1 to DD_2, resulting in an increase in profit-maximising

output from $0Q_1$ to $0Q_2$. This will result in an increase in price from $0P_1$ to $0P_2$. Hence, total revenue rises from $0P_1aQ_1$ to $0P_2dQ_2$ while profits rises from P_1abc to P_2def.

<u>Gains from EOS</u>

- Viatris can also experience greater internal EOS such as commercial or financial EOS due to an increase in output.
- The merged firm would have a presence across every continent and major market, as well as create a financially strong company with truly global reach (extract 4). This will give the firm greater bargaining power when seeking loans or negotiating contracts with retailers.
- SRAC falls and hence TC falls.
- Hence profits increase. **(area P0BCAC0 increased to area P1DEAC1)**



Limitation for Viatris

<u>Losses due to DEOS</u>

- However, the merged firm may suffer from DEOS if the merger creates management problems, especially stemming from the cost-cutting measures that will take place (extract 4).
- This will result in higher AC and TC for the firm.
- Hence profits may decrease.

<u>Less substantial increase in Demand</u>

- The increase in demand for the new products may also take time and depends on the receptiveness and advertising efforts of the new firm.
- An unsuccessful merger may not be able to capture the market share of other drug companies and the merged firm will not be earning higher profits.
- Demand may not increase substantially.
- Hence AR and TR may not increase substantially.

- If AC and TC rises more than AR and TR, then profits will decrease.

Gains and Losses for other producers

Losses

Smaller players in the market stand to lose as the market share may be competed away. This is as Viatris, as a larger entity, may now be better able to compete. E.g. Demand for the Viatris' products would increase as Mylan would be able to sell products in Pfizer's established markets (extract 4). This will result in lower market share for competitors of Viatris' products in these markets.

Generally, there should be no gains for other firms.

Gains and Losses for Consumers

Gains through lower prices

- From the above, if the merged firm experiences internal EOS and lower unit costs, they may pass down these cost savings to consumers through lower prices, consumer welfare rises.
- This will increase consumer surplus.

Gains through availability of new products

- Consumers in new markets that are now able to buy new products enjoy new choices that were previously not available to them.
- This can increase consumer welfare due to more choices available to consumers.

Losses through higher prices

- However, these scenarios may not be true. The merged firms have higher market share.
- This gives them higher pricing power and charge consumers higher price.
- This reduces consumer surplus.
- In addition, the merged firm may remove duplicate drugs from the market.
- This will reduce consumer welfare due to lesser choice available.

Conclusion/Evaluation

- Stand: Depends on market conditions
- Pharmaceutical industry stands to gain more if the merger offers ability for the merged firm to have more ability to do transformational R&D and offer more variety of drugs such as Covid-19 vaccines to avert the pandemic.
- This will benefit the consumers too.

OR

- Stand: Depends on the firm's decision in the LR
- In the SR, due to the merger process, the firm may take time to consolidate and tries to compete against its competitors
- When competing, consumers may gain if they are offered lower prices
- However, in the long run, when the merged firm is in a position to raise prices, society and consumers may lose.

Mark Scheme

Level	Knowledge, Understanding, Application and Analysis
L3 (5 – 7)	Well-explained, well-developed **analysis regarding the impact on consumers and producers.** Answer made reference to context.
L2 (3 – 4)	Under-developed analysis regarding the impact on consumers and producers. Brief analysis that is one-sided. Answer made little reference to context.
L1 (1 – 2)	Grave conceptual errors Answers are too brief and sketchy
Evaluation	
E2 (2 – 3)	Reasoned judgement with clear criteria – 3m
E1 (1)	Judgement without reasons or with unclear criteria Mere conclusion

Markers' Comments

- Weaker answers showed limited analysis of points e.g. failed to elaborate how increase in market share can benefit the firm. Sometimes, these answers were short or combined different points together, e.g. as consumers are able to purchase products at a lower price, they can enjoy a greater variety.
    - Lower prices should instead result in greater quantity demanded (i.e. consumer affordability) and hence consumer surplus rises.

- There was poor interpretation of the question. E.g. "On balance" does not mean the benefits and costs have to be balanced.
    - On balance means "when all factors are taken into consideration."

- Some were confused about benefits for society and benefits for consumers e.g. equity and efficiency are concerns of the society whereas the enjoyment of external EOS is a concern of the industry.
    - Consumers are interested in price, choice and quality.

		• Weak evaluation was seen where students merely summarized their points made. • Stronger answers made good analysis of gains of both consumers and producers and sound limitation of these gains. Examples were taken from the extract and details were provided, e.g. how demand increase as Viatris can establish a presence in more than 165 markets, which resulted in higher demand for Viatris' products, thereby increase revenue and profits.	

Question 4: Changes in the Airline Industry (Source: 2022 SAJC Final Examinations)

Suggested Answers

(a)	(i)	**Identify and explain one measure used by economists to assess the level of competition in an industry.**	[2]
		The 4-firm concentration ratio which measures the sum of the market share percentage of the top 4 firms in the industry can be used to assess the level of competition in an industry. The higher the concentration ratio, the lower the level of competition in the industry.	
		Examiners' Comments **Content:** • While many were able to identify market concentration ratio as the measure used, some answers showed gap in understanding that market concentration ratio looks at the *combined* market share of top few firms in the industry. • Some answers used concentration ratio to identify the type of market structure without linking to level of competition. • Weaker answers used number of firms, BTE or elasticity concepts. **Skills:** • Some students did not address question fully as they did not draw the link between market concentration ratio to level of competition.	

	(ii)	**With reference to Figure 1, describe how the measure identified in (i) changed between 2008 and 2020 and explain what this suggests about the level of competition in the US airline industry.**	**[2]**
		From Table 1, the 4-firm concentration ratio has increased from 2008 to 2020. OR Market share of the top 4 firms has increased. / Market share of 'all others' firms has decreased. This suggests that the level of competition is likely to be lower in 2020 compared to 2008 as the market share held by the top 4 firms in the airline industry is higher in 2020 than in 2008.	
		Examiners' Comments **Content:** • Many were not able to correctly link the increase in concentration ratio to a decrease in competition, exhibiting gaps in their understanding of market concentration ratio. **Skills:** • A number of students did not use comparative words (i.e. lower/lesser) to describe the change in the level of competition, and instead used 'low level of competition', missing the idea that there is a **change** in the level of competition due to the change in market share.	
(b)		**Explain whether the dynamic pricing strategy mentioned in Extract 1 that is practiced by airlines is likely an example of price discrimination.**	**[6]**
		Price discrimination occurs when firms charge consumers different prices for the same good, for reasons not associated with cost difference. **Conditions for price discrimination** 1. Able to segment the markets (diff PED values) 2. Prevent resale across markets 3. Imperfect competition **Dynamic pricing strategy of charging two different prices as in the case of Mr Russell Pedley and his wife is an example of price discrimination.** Buying the ticket via his frequent flier account brought about a price that is higher compared to his wife as the United Airlines system would have identified that Mr Pedley, who is a silver-level frequent flier, might have a PED value that is likely to be lesser than 1. This is especially so as he would have developed a certain level of brand loyalty to United Airlines **[inferred from his silver-level frequent flier status]**.	

		On the other hand, the system of United Airlines would have viewed the profile for his purchase for his wife via the mobile app as a potential new customer and thus would likely have a PED value that is likely to be greater than 1 due to the many other close substitutes available. As such, there is an ability for United Airlines to segment the market by the difference in PED value. Additionally, there is no resale of air tickets allowed as the named passenger would have to be present for the ticket to be validated and used. Also, as seen in part (a), the US airline industry is likely operating in an oligopoly and thus there is certain level of market power for United Airlines to set their own prices. Lastly, if the booking is for the same cabin and same class, then there would not be a difference in cost and thus the above is an example of price discrimination. **Dynamic pricing strategy of charging two different prices as in the case of Mr Russell Pedley and his wife is NOT an example of price discrimination.** This would not be an example of price discrimination if the higher price charged is due to higher cost of production incurred. For example, if Mr Pedley's ticket was for a seat with more legroom/ space or if his ticket has a higher baggage allowance which might lead to higher cost incurred by the airline to provide such services compared to his wife's ticket.	
		Examiners' Comments **Content:** • Many students were able to explain what price discrimination was and applied their understanding into the context provided to determine if dynamic pricing was indeed an example of price discrimination. • There were gaps observed when students defined the economic term - price discrimination, without linking to the fact that prices are charged differently for reasons not associated with cost differences. **Skills:** • When trying to apply the 3 conditions for price discrimination to the context, students struggled in the following areas: - In explaining that United Airlines had price-setting ability, students should identify why they are able to set prices -that they are likely in an oligopolistic market, thus they would have market power and the ability to set prices. - When explaining the ability to segment markets based on PED values, students should try to contextualize with the examples given instead of coming up with their own examples.	

- A large number of students missed out on the counter-argument to explain the possibility of dynamic pricing not being an example of price discrimination. When the question is asked "explain whether", students should note that they are expected to provide a 2-sided response.

(c) **With reference to Extract 3, assess whether supply factors, rather than demand factors, are the key cause of "sky-high" airline ticket prices.** **[8]**

Question Interpretation

Command Word	Assess whether
Content	Supply factors vs demand factors "sky-high" airline ticket prices
Context	Airline ticket prices

Schematic Plan

"Sky-high" airline ticket prices	
Side 1 **Supply factors, rather than demand factors are the key cause of "sky-high" airline ticket prices**	**Side 2** **Demand factors, rather than supply factors are the key cause of "sky-high" airline ticket prices**
Synthesis	

Introduction

Prices are determined by the interaction between demand and supply curves. As suggested in Extract 3, there are a number of demand and supply changes that can help in explaining the rise in prices. To explain the "sky-high" airline ticket prices, we would need to also bring in PED and PES concepts.

Side 1 - Supply factors, rather than demand factors are the key cause of "sky-high" airline ticket prices:

Higher oil prices resulting in higher COP [Extract 3]

Russia's invasion of Ukraine has exacerbated a steady rise in crude oil prices over the past 18 months. Jet fuel now represents as much as 38 per cent of an average airline's costs, up from 27 per cent in the years leading to 2019. [Extract 3]

With the rise in cost of production, this would have the effect of lowering the supply of air travel assuming ceteris paribus.

Uncertainty due to Covid-19 restrictions & the level of ramping up of flights [Extract 3]

		Carriers are cautious about bringing back all their idled jets, even though most countries have eased cross-border restrictions…The pinch is most acute in Asia, which was the slowest to ease restrictions, and as China, the biggest market in the region, remains essentially closed. [Extract 3] As a result of the uncertainty brought about by the Covid-19 pandemic, airlines were cautious in their level of ramping up of flights as they manoeuvre the gradual easing of restrictions across countries. With China and its strict zero-Covid policy, this meant that the level of increase in supply of air travel was limited. **Lack of staff [Extract 3]** In the US, smaller regional airlines cannot fly at full capacity because bigger carriers have hired away too many pilots. Hundreds of flights have been cancelled in Britain, scuppering holiday plans and leading to long delays and scenes of passengers sleeping at airports. In Europe, major airports have faced delays and cancellations after failing to hire adequate staff. That has disrupted airline schedules and added to costs. [Extract 3] Due to the lack of staff available for employment, e.g. pilots, this has also limited the ability for airlines to increase their supply of air travel. **Overall, there is likely a fall in supply as the extent of the rise in cost of production is likely to outweigh the extent of increase in supply as explained due to the constraints faced in ramping up flights.** **The "sky-high" airline ticket prices would also be dependent on the PED value for airline tickets. As suggested in Extract 3, the higher ticket prices did not seem to dissuade consumers from wanting to fly. This suggests that the demand for air travel is likely to be relatively price inelastic.** **As such, when faced with a fall in supply, given that PED<1, this could help explain the large extent in increase in airline ticket prices.** **<u>Side 2 - Demand factors, rather than supply factors are the key cause of "sky-high" airline ticket prices</u>**: **Revenge travel increasing the DD [Extract 3]** As a result of the Covid-19 pandemic which prevented large number of people from travelling due to the various border restrictions and strict quarantine regulations, the ability to travel again arising from the easing of these border restrictions and quarantine regulations resulted in a rise in demand for travel as suggested in Extract 3 –"revenge travel" with Delta Airlines chief executive, Ed Bastian, suggesting that the "demands is off the chart". **The "sky-high" airline ticket prices would also be dependent on the PES value for airline tickets. As suggested in Extract 3, airlines faced difficulty in their hiring of pilots which would thus suggest that the supply is relatively price inelastic.** **As such, when faced with a rise in demand, given that PES<1, this could help explain the large extent in increase in airline ticket prices.** **Synthesis** Overall, both the demand and supply factors played their parts in the rise of prices of air tickets. However, given the situation explained in Extract 3, it is likely that the supply factors are the key cause of the "sky-high" prices	

as it seems to suggest that the supply side is unable to catch up with demand. Many of the supply-side factors would require a good amount of time before we see any improvements in the easing of these effects. For example, in order to have sufficient pilots, time may be required for training to be undertaken to ensure that the pilot trainees are sufficiently trained and skilled. In addition, a number of countries within Asia, such as Japan and China are still slow in opening up their borders and this may lead to airlines adjusting their increase in supply in tandem to these border reopening. Thus, it would take a while before we see any improvement in the form of a slower increase in prices.

Level (Marks)	Knowledge, Application, Understanding and Analysis
L2 (4 – 6)	Developed and balanced explanation which considers whether supply factors or demand factors are the key causes of "sky-high" air ticket prices. 2 requirements of the questions which are demand-side factors and supply-side factors are well-explained with appropriate tool of analysis (e.g. with well referenced diagrams) and with good application to the context.
L1 (1 – 3)	Under-developed explanation of whether supply factors or demand factors are the key causes of "sky-high" air ticket prices. 2 requirements of the questions which are demand-side factors and supply-side factors are presented with gaps in explanation OR only 1 requirement is present Answer shows some knowledge but does not indicate that the meaning of the question has been properly grasped. Basic errors of theory or an inadequate development of analysis may be evident. Where the answer is mostly irrelevant and only contain a few valid points made incidentally in an irrelevant context.
E1 (1 – 2)	Marks will be awarded for answers that arrive at conclusion after considering whether supply factors or demand factors are the key causes of "sky-high" air ticket prices.

Examiners' Comments

Content:

Many students were able to identify demand and supply factors provided in the extracts.

Some students incorrectly used quantity supplied and quantity demanded instead of demand and supply.

Some students used PED or PES to explain the relative shifts in demand or supply. This is inaccurate as price elasticity of demand/supply is related to the extent of change in quantity demanded or quantity supplied.

Skills:

		Most students provided relevant demand and supply diagrams to show the rise in price but generally did not factor in PED and PES to show the rapid or sky-high prices. Some students did not bring in price adjustment process while a few only gave demand and supply changes without adequately explaining the price change. Many students either made a statement of demand or supply factors being more significant without any or sufficient justification while others did not have any evaluative comment at all.	
(d)	**(i)**	**Identify and explain the type of integration described in Extract 2.**	**[2]**
		Horizontal integration. Both are airlines which are in same industry and same production stage.	
		Examiners' Comments **Content:** • Most students were able to identify the type of integration correctly. However, there was still a number of students who were confused in their understanding of the types of integrations.	
	(ii)	**Discuss the factors the US Justice Department should consider when deciding whether to approve the integration of JetBlue and Spirit.**	**[10]**
		Question Interpretation **Command Word**: Discuss **Content**: Factors US Justice Dept should consider Integration of JetBlue & Spirit **Context**: US Airline industry	
		Schematic Plan **Integration of JetBlue & Spirit** **US Justice Department** **Factors to consider** **Cost of integration** **Benefits of integration** **Information related to integration** **Synthesis**	

Introduction

When deciding whether to approve the integration of JetBlue and Spirit, the US Justice Department will weigh the possible benefits and costs of the integration to determine the extent to which the merger can lead to an improvement in society's welfare.

In determining the extent of the benefits and costs to society, the government will need to consider factors such as the extent to which the integrated firm will experience greater market power, the degree of contestability in the market and the extent of EOS that can be reaped by the integrated firm.

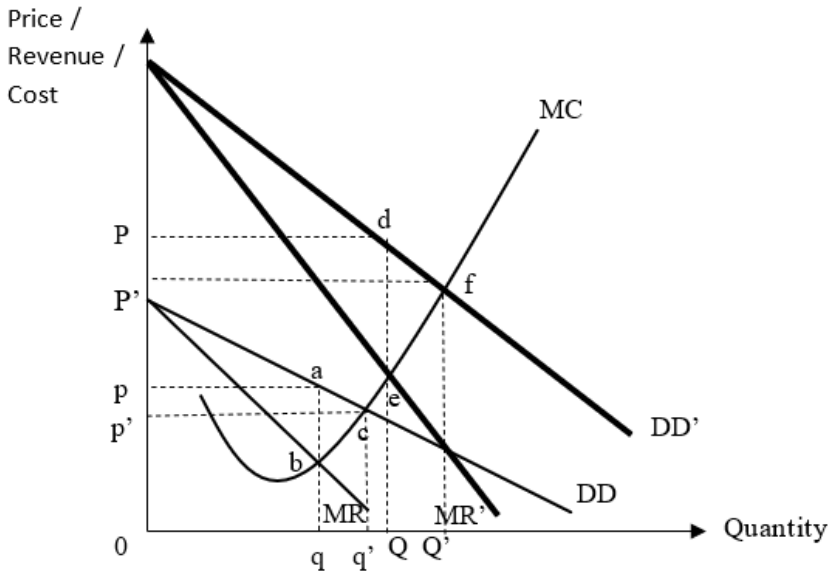
Factor 1: Cost of integration to society

As suggested in Extract 2, the integration by JetBlue and Spirit would create USA's fifth largest airline by market share of about 10%.

The extent of the increase in market power of the integrated firm is an important consideration as it affects societal welfare.

The integrated firm with increased market power now enjoys higher and more price inelastic demand for its products. Hence, there is **greater welfare loss** due to market power.

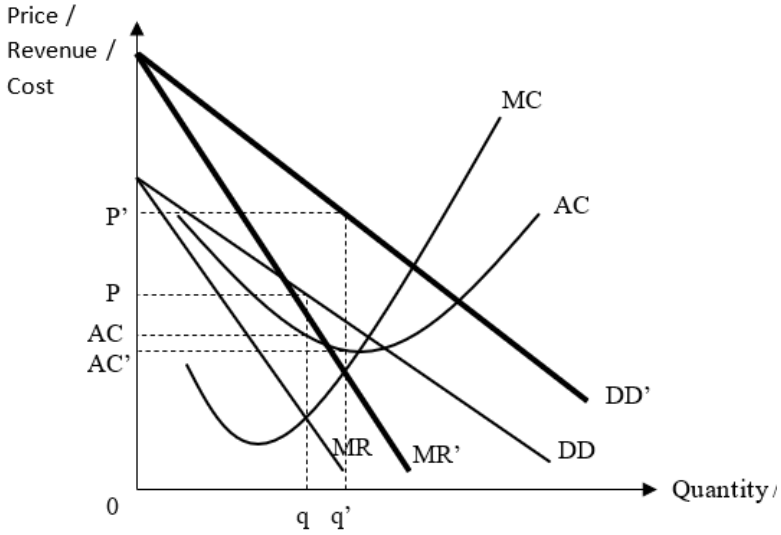
With reference to figure below, before the integration, there was underproduction since for the units between the profit maximising output level (q) and the allocative efficient level (q') and P>MC. From units, q to q' the additional benefit > additional cost and there will be a net benefit to society of area abc if these units were produced. By restricting output to q, the firm has caused welfare loss to society as measured by the loss in the potential net benefit of area abc. After the merger, there is greater allocative inefficiency and welfare loss; the **welfare loss has increased from area abc to area def** due to the restriction of output to Q instead of Q' which is where societal welfare is maximized as P=MC.



The greater the market power the integrated firm experiences, the greater its ability to profitably raise prices, leading to **exploitation of consumers**

because of higher price charged and **greater profits earned**, which results in **greater inequity in income distribution**.

As a result of the integration, the integrated firm will have higher and more price inelastic demand as DD increases to DD'. With reference to figure below, consumers are now charged a higher price of P', while firms enjoy an increase in profits from [(P-AC) x q] to [(P'-AC') x q']. This worsens inequity between consumers and firms, and since shareholders of firms are more likely to be middle- or high-income households, inequity in income distribution between households worsens.



Benefits of integration to society

The greater the market power the integrated firm experiences, the greater its ability to conduct R&D which results in **greater dynamic efficiency**. R&D tends to be costly and inherently risky with uncertain results. The integration can possibly result in **lowered costs** (assuming the new firm **can enjoy EOS** from a **larger scale of production**) and **increased profits** earned (as analysed in the previous paragraph) which allows the integrated firms to have **greater ability to undertake investments in R&D**. This can result in **process and product innovation**, which **enhances dynamic efficiency and improves society's welfare over time.**

When a firm expands through integration, the increased scale of production enables it to spread cost across a larger business reaping internal economies of scale. As a result, the firm may enjoy cost savings in the form of lower average costs. Assuming the merged firm passes on its cost savings to consumers, consumers pay a lower price, corresponding to the new profit-maximising output thereby increasing consumers' welfare. The lower price also makes the good more affordable for consumers, especially the poor, improving equity in distribution of goods as the low-income households are better able to access the good.

Concentration ratio of the market currently/ Contestability

The theory of contestable market suggests that the crucial determinant of the price and output behaviour of firms depends on whether there is credible threat of competition; the number of firms in the market is irrelevant. Hence, as long as there is a high degree of contestability where the credible threat of potential competition is high, firms will still behave competitively. The high level of competitive pressure prevents firms from

abusing their market power; firms would behave competitively, setting low prices. This allows the market to achieve close to the benefits of competitive markets, where there is likely to be less allocative inefficiency as firms charge a low price to maintain competitiveness due to the threat of competition; there is also less X-inefficiency as firms are less complacent and would strive to be cost-efficient given the threat of competition.

Hence, in deciding whether to approve the integration, the US Justice Department would not only consider the degree of market concentration but also the degree of contestability of the market following the merger.

As suggested in Extract 2, JetBlue has said it will pre-emptively divest from certain airports where it and Spirit together have a big presence. In addition, the airline also said it expected to grow at the hub airports of the larger carriers, such as Las Vegas, Dallas, Houston, Chicago, Detroit, Atlanta and Miami — a strategy devised in part to win over antitrust regulators who are eager to see more competition at airports where one or two airlines control most gates and flights. These moves seem to suggest that JetBlue is committed to ensuring the contestability of the market remaining high despite the integration proposed.

Synthesis

In conclusion, the US Justice Department in their bid to maximise societal welfare, would need to weigh the marginal benefits and marginal costs of the integration between JetBlue and Spirit. It is also imperative for the US Justice Department to also consider information such as the contestability of the market in making the decision as it plays an important role in determining the outcome of the decision and ensuring that the decision made would have considered multiple perspectives/ sufficient grounds.

Nevertheless, while these are some of the factors to be considered, given the dynamic nature of market conditions, this may make decision making more difficult as the factors may experience changes. Therefore, the US Justice Department should try to undertake a comprehensive analysis of the situation and consider other available information and perspectives before deciding on the outcome of their decision.

Level **(Marks)**	**Knowledge, Application, Understanding and Analysis**
L2 (4 – 7)	Developed and balanced explanation of the factors that the US Justice Department would need to consider when deciding on whether to approve the integration of JetBlue & Spirit. 2 requirements of the question on factors that the US Justice Department would need to consider when deciding on whether to approve the integration of JetBlue & Spirit. This is done and supported with an appropriate tool of analysis and with good application to the context.
L1	Under-developed and/or unbalanced explanation of factors that the US Justice Department would need to consider when

		(1 – 3)	deciding on whether to approve the integration of JetBlue & Spirit. 2 requirements of the questions are presented in a cursory manner without adequate use of an appropriate tool of analysis OR Only 1 requirement of the question has been considered. Answer shows some knowledge but does not indicate that the meaning of the question has been properly grasped. Basic errors of theory or an inadequate development of analysis may be evident. Where the answer is mostly irrelevant and only contain a few valid points made incidentally in an irrelevant context.	
		E2 (2 – 3)	Able to give a well justified conclusion on factors that the US Justice Department would need to consider when deciding on whether to approve the integration of JetBlue & Spirit. Assessment given in terms of e.g., context, recommendation, etc	
		E1 (1)	Assessment given in terms of e.g. combination of factors but not substantiated.	
		Examiners' Comments **Content:** • Students were generally able to identify the cost and revenue advantages towards the firms of merging. • A number of students showed misunderstanding between profits (TR-TC) and total revenue (P x Q). This was especially obvious when they made reference to the diagram in their explanation. (i.e. explained an increase in profits but when referencing diagram, identified the increase in TR instead). **Skills:** • Students should note that when looking at the cost and benefits from the point-of-view of society, they should look at the outcomes on the different types of efficiencies and equity. • Many students instead focused their analysis of the cost and benefits from the perspectives of either the consumers or producers. • Students should also note that when evaluating, they should evaluate based on the question posed. The question here asked for a discussion of factors to be considered. In providing an evaluation, students should focus on suggesting what are the possible factors to be considered (i.e. the most important factor or looking at a comprehensive set of factors) and refrain from making a judgement	

		in terms of whether to allow the merger or not as this is not the focus of the question.	

Question 5: Public Transport in Singapore (Source: 2023 SAJC Final Examinations)

Suggested Answers

(a) Using Figure 1, compare the average ridership per day between the different modes of transport between 2018 and 2022. [2]

- The average ridership per day for both trains and bus generally decreased from 2018 to 2022.

AND

- The average ridership per day for bus is always higher than the average ridership per day for trains from 2018 to 2022.
- The fall in ridership of trains was greater than the fall in ridership of buses.

Examiners Comments

General Comments
Students generally did well for this question, being able to identify the key points of comparison.

Question interpretation
Students were able to identify that for a "compare" question, they should provide similarities and differences

Skills
Some students did not use comparative words/phrases like "both, "while" and "on the hand" to show similarities between the two trends.

Some students highlighted the sharp fall as a similarity, which is not accepted as it is not indicative of the entire period of 2018-2022.

(b) With reference to Extract 1, explain the likely impact of Covid-19-related restrictions on SMRT's total revenue. [2]

- Demand for public transport falls due to COVID-19 restrictions where employees are unable to commute to work and are required to work from home. This is further supported by data in Table 1 which shows the decrease in average ridership from 2020 to 2021.
- Total Revenue = Price x Quantity. There will be a decrease in quantity while prices are being fixed by the PTC, therefore TR will fall.

Examiners Comments

General Comments
Students were able to identify the concepts tested correctly and factors affecting the falling demand for public transport during Covid-19.

Question interpretation
A small handful had mistaken and wrote about how the total revenue is affected with the removal of Covid-19 restrictions.

Phrasing issues
Students had assumed fall in demand must logically lead to a fall in total revenue without further elaboration. It is imperative for students to explain that total revenue is the product of price and quantity, thus the fall in number of travelers will lead to a fall in total revenue. It is also important for students to be clearer in their elaboration that falling number of travelers refer to falling "population" of public transport riders, which thus causes a fall in demand for public transport. Many had simply written there is a fall in travelers due to restriction, which lacks the use of key terms.

(c) Explain the condition under which a firm would shut down in the short run. [2]

A firm will shut down in the short run if it is making subnormal profits (TC<TR) **and** when its total revenue is unable to cover total variable costs (TR<TVC, or AR<AVC).

Examiners Comments

General Comments
Most candidates were able to identify subnormal profits and the condition for subnormal profits being TR<TC. However, many candidates failed to understand that a firm would shut down only when TR<TVC.

Content issues
There seem to be some misconception that a firm would shut down immediately if TR<TC in the short run.

(d) Explain why public transport in Singapore is not a public good. [4]

A public good must have the characteristics of being non-excludable and non-rivalrous in consumption.

- Public transport in Singapore is not a public good as it is excludable. If commuters do not pay their fares, they can be excluded from consuming public transport services.
- Public transport in Singapore is not a public good as it is rivalrous in consumption. The consumption of public transport services by one commuter reduces the number of seats or space available for another commuter.

[Candidates need to explain both excludability and rivalry in consumption for full marks. Non-Rejectability is not accepted as a reason.]

Examiners Comments

General
The cohort did not fare well for a straightforward question like this. Many students did not know what public goods were or only possessed an inadequate grasp of its technical definition. This shows that majority of the students were not sufficiently prepared during their

revision to answer a question about public goods. It was common to encounter scripts that used the colloquial understanding of "public" to explain public goods (e.g. "public goods are goods provided for the public") which were incorrect as the term "public goods" has a technical definition in Economics.

Only about half the cohort were able to provide relevant answers. Even then, among this half, only a minority of students were able to clearly and accurately explain the relevant content required to answer this question.

Question interpretation

This question required students to apply the characteristics of public goods to explain why public transport in Singapore are not public goods. However, many students did not know what the characteristics of public goods were and were therefore unable to address the question. Of those who knew the characteristics of public goods, there were still students who opted to explain non-rejectability in place of non-excludability or non-rivalry. For questions on public goods, the two key characteristics of non-excludability and non-rivalry are necessary and sufficient, and must be explained. There is no need to include non-rejectability.

Phrasing issues

- The plural form for public transport is "modes of public transport" and not "public transports".
- The terms "non-excludable" and "non-rivalrous" are adjectives that describe the goods, while the terms "non-excludability" and "non-rivalry" are nouns that describe the state of being non-excludable or non-rivalrous. The following statements should be rephrased to linguistical clarity:
    - To be a public good, it needs to be ~~non-excludability~~ non-excludable…
    - Public goods are non-excludable and ~~non-rivalry~~ non-rivalrous
    - Public transport is ~~rivalry~~ rivalrous because…
    - There is ~~rival in public transport~~ rivalry in the consumption of public transport…
- "Non-exclusive" does not have the same meaning as "non-excludable".
    - The former means that something is "not restricted to" whereas the latter means that it is "not possible to restrict something to".
- "Non-rivaled" (taken to mean "unrivaled") does not have the same meaning as "non-rivalrous".
    - The former means that there is no competition for something (e.g. describing a firm's sales as "unrivaled" means that it has the highest sales, and far higher than the second contender) whereas the latter is a term that is usually only used to define public goods, meaning that "a person's consumption of a good will not diminish the consumption of the same good by another person".
- In explaining non-rivalry, it is vague to say that "the consumption of the good by one person would not *affect* another person's consumption". It would be clearer to state that the consumption of the next person "would not be diminished", or something to that effect.

Content issues

- Public goods are goods that are non-rivalrous and non-excludable in nature. Common misunderstandings about the definition of public goods:
    - Public goods are not defined as goods provided for the public.
    - Public goods are not defined as goods that are government-owned or government-provided.
    - Public goods are not goods that are free for all to consume.
- Many students confused the terms "exclusive" and "excludable", and were mistaken to think that "excludable" means that people have to exclusively consume only public

transport, and not any other alternative modes to transport. This is an incorrect understanding of what non-excludability, which is about the possibility of excluding non-payers, means.

- Non-excludability is about the impossibility of excluding non-payers from the consumption of the good once it has been provided. While this means that everyone would thus be able to consume the good for free, it is not precise to say that non-excludable means "free". In explaining non-excludability, the idea that it is "impossible to exclude non-payers" is important.
- Non-payers are just people who do not pay, not necessarily because they cannot afford to. It is inaccurate to say that public transport is excludable because it excludes low-income families or people who are unable to pay. It merely excludes non-payers, regardless of the reason why they do not pay.
- Non-excludability results in the problem of free ridership and concealed demand. However, free ridership and concealed demand does not define non-excludability – they are just consequences of non-excludability. This question requires students to explain what non-excludability means. Therefore, explanation of its consequences in terms of free ridership and concealed demand is irrelevant.
- Non-rivalry refers to how the consumption of a good by one person will not diminish the consumption of the same good by another person – i.e. the good itself is not rivaled as it doesn't diminish with consumption and will always be able to satisfy other consumers. It does not mean the lack of competitors (i.e. SBS vs SMRT), in which case the rivalry refers to the competition between firms. In explaining public goods, non-rivalrous describes the nature of the good, and not the competition between firms producing the good.
- In explaining rivalry, it is not enough to just describe public transport as "having limited capacity/space". The limitation on capacity/space is a reason for the rivalry, but the idea of rivalry must be explained by the impact of one person's consumption on the consumption of the another (i.e. that it would diminish the consumption of the next person).
- Non-rivalry results in the marginal cost of provision of public transport for an additional passenger to be zero (i.e. MC=0). However, this is just the consequences of non-rivalry, and not its definition. This question requires students to explain what non-rivalry means. Therefore, explanation of its consequences in terms MC=0 is irrelevant.
    - In any case, the majority of students who attempted to explain this consequence did so incorrectly. As the content is not relevant to this question, the mistakes will not be explained here. However, students who have misconceptions about this should clarify them with their tutors.
    - A handful of students who explained the MC=0 consequence correctly went on to claim that price of public transport should therefore be zero (P=0) and a non-zero price would mean that it is not a public good. It is not true that public goods must have P=0. Public goods can have a non-zero price, but it would be allocatively inefficient for public goods to have a non-zero price since the condition for allocative efficiency is P=MC.

(e) (i) Taking transportation as an example, explain what is meant by a 'negative externality'. [2]

A negative externality is a cost that accrue to a third party who is not involved in the economic transaction.

As a commuter drives his personal car, there will be costs to third parties such as pedestrians. The exhaust fumes are external costs to pedestrians as these fumes might result in medical costs arising from breathing problems/sickness.

Examiners Comments

General Comments

The majority of students were not able to score the full marks for this question with most scoring one out of the two. Students tended to lose the second mark as they either did not clearly state who the third party was or what the cost is.

Question interpretation

- A minority of students spent an excessive amount of time explaining how there was market failure. Some students even went on to draw diagrams to show how there was deadweight loss. This shows a poor interpretation for a variety of reasons:
    - The question clearly just asks students to make use of an example to explain what negative externalities are and NOT how transportation causes market failure.
    - The mark allocation of 2m should signal to students that the question cannot be asking for how transportation would lead to market failure.

Content

- In explaining negative externalities, many students did not specify who the third party was, or specified something that was not an economic agent (e.g., the environment). Third parties should be economic agents (e.g., people who live near congested road) who are uncompensated for the costs they incur.
- It is also important to specify that cost that is incurred by the third party. It is insufficient to say that the public is affected by pollution or by global warming . Instead, it should be specified that the public would incur greater healthcare costs because they must consume more medical services when their health is affected by the pollution.

(e) (ii) With reference to Extract 2, "MOT hopes to raise the mass public transport usage during peak hour to 75 per cent by 2030". [8]

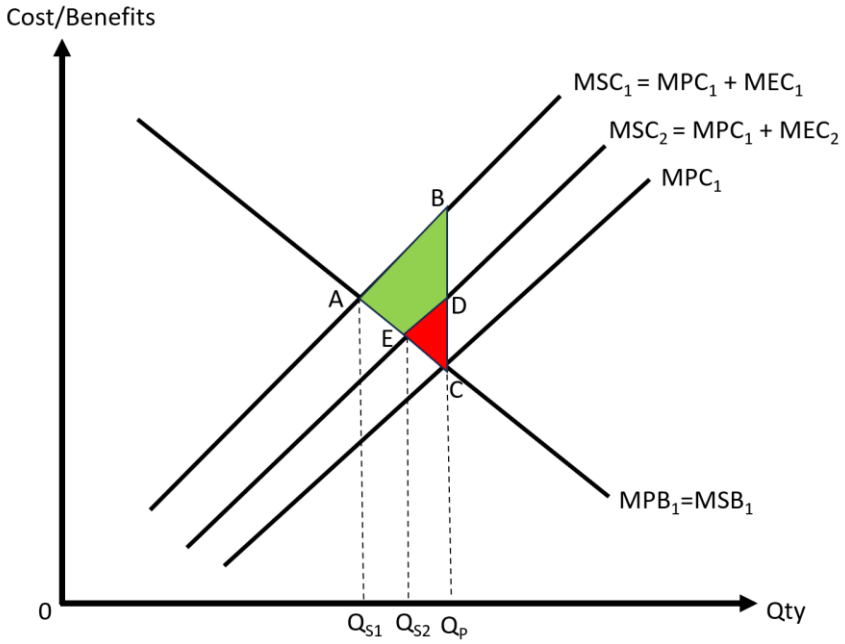
With reference to the data, discuss the view that encouraging greater use of mass public transport is the best policy to eliminate the deadweight loss from the negative externalities arising from the consumption of transportation.

Requirement 1: Explanation on why encouraging greater use of mass public transport is a good policy to reduce DWL.

- There are negative externalities involved in the consumption of transportation such as air and noise pollution for third parties. These negative externalities will not be internalised by consumers of transportation who only equate their MPB = MPC, and consume at Q_P.
- The socially optimal level of consumption is where $MSC_1 = MSB_1$ with QS_1 level of consumption. This generates a deadweight loss given by the area ABC.
- Encouraging greater use of mass public transportation will reduce the negative externalities associated with transportation as there is less cars on the road

resulting in less congestion, i.e. MEC will be lesser. Thus, the divergence between MSC and MPC will be smaller due to a lower MEC, i.e. MSC curve will shift to MSC_2.

- This results in a smaller DWL given by the area CDE, and society is better off as compared to its initial state. However, the DWL is not completely eliminated.



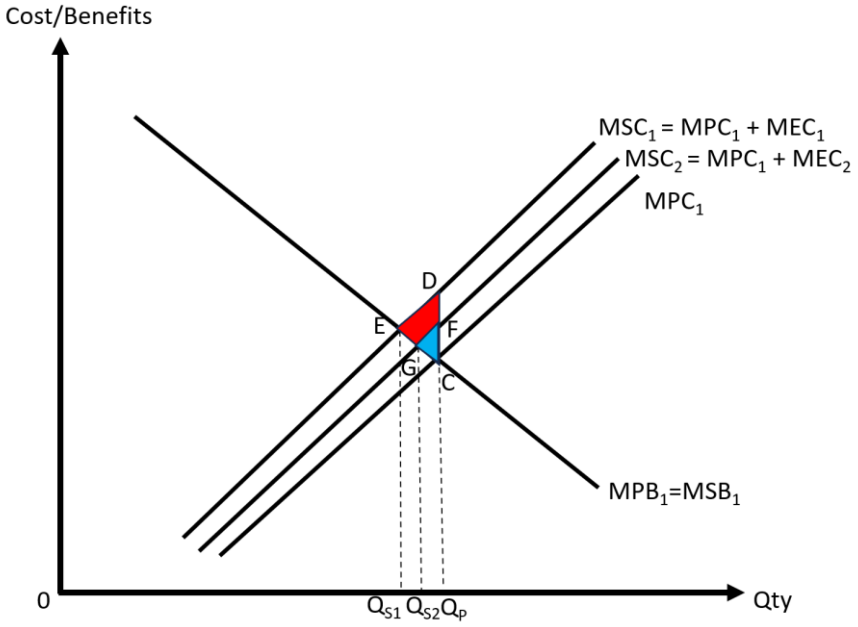
Requirement 2: Explanation on another policy to reduce/eliminate DWL.

Option 1: Government Regulations to introduce EVs

- As stated in Extract 2, there are plans to move towards a more sustainable public transportation system with the use of government regulations to introduce EVs. Therefore, there is likely to be a further reduction in the MEC associated with the consumption of transportation, e.g. carbon emissions for EVs are half of internal combustion engine types. Thus, the MSC curve is likely to be shift further downwards to MSC_2 due to lesser negative externalities.
- Following from the earlier diagram, the DWL area CDE will further reduce to area CFG, bringing society closer to eliminating the DWL.

Evaluation:

- Both policies should work in tandem. In the short term, the government will need to encourage greater use of public transport while better connectivity via more rail lines is being constructed. In the longer term when more people have substituted to public transport and when EV prices are expected to decrease (Extract 1), substituting to greener vehicles can help to reduce the DWL further.



OR

Option 2: Introduction of Hybrid Work Arrangements by Firms

- As stated in Extract 1, there is a new era of hybrid work, where people toggle between home and office, depending on their work requirements. When more employers introduce hybrid work arrangements, there will be lesser need for people to commute and hence greatly reduce their consumption of transportation, especially during peak periods where MEC is likely to be greatest.
- This might be a better policy as it greatly reduces the consumption of transportation and therefore greatly reduces the negative externalities associated with transportation. However, firms might only consider whether productivity is enhanced, or whether profits are maximised, i.e. they will not consider the MEC associated with transportation.

Evaluation:

- Hybrid work arrangements policy may be beyond the purview of the government to regulate, and the implementation may be uneven across firms, e.g. schools will still need to have teachers and students located on-site. The average ridership from Figure 1 also shows a steady increase post-COVID which suggests that more people are commuting back to their workplaces.

Level (Marks)	Knowledge, Application, Understanding and Analysis
L2 (4-6)	Developed and balanced explanations which considers two policies to eliminate the deadweight loss from the negative externalities arising from the consumption of transportation. Two requirements of the questions which are (1) greater use of public transportation and (2) second policy to reduce/eliminate DWL are well explained with appropriate tool of analysis (e.g. with well referenced diagrams) and with good application to the context.

L1 (1-3)	Under-developed explanations of the requirements of the question, e.g. only 1 requirement well-explained or cursory explanations of 2 requirements. Answer shows some knowledge but does not show understanding of the requirement of the question, i.e. link to DWL. Basic errors of theory or an inadequate development of analysis may be evident. Where the answer is mostly irrelevant and only contain a few valid points made incidentally in an irrelevant context.
E1 (1-2)	Marks will be awarded for answers that considers the limitations and/or effectiveness of both policies.

Examiners Comments

General Comments

Responses to this question were generally poor. While students were able to illustrate how deadweight loss is a result of the negative externalities arising from the consumption of transportation in general (i.e., market failure), it is more important for them to be cognizant of the fact that the market failure is due to the divergence between MPC and MSC (MSC = MPC + MEC) given the presence of MEC of each unit of transport consumed. Few students applied this understanding. They were unable to see how encouraging the use of public transport such that people switch away from private transport, could help to reduce MEC, the divergence between MPC and MSC, and in turn reduce the deadweight loss.

Few students were also unable to clearly make distinction between different types of transports in their analysis e.g., public transport vs private transport; clean-energy transport vs petrol-powered transport. As such discussion of alternative policies were often unclear and disorganized. In addition, diagrams were poorly labelled as the types of transport market are not properly identified.

Question interpretation

- The question is phrased in a straightforward manner.
- Most students recognized the 2 requirements of the question– 1) “encouraging greater use of mass transport” as a policy and 2) an alternative policy besides using mass public transport, to address market failure in the transportation. This is evident from the way most students structured their responses. Most were also able to provide some comparison and judgement on the effectiveness of the 2 policies. However, quality of the responses was badly affected by poor conceptual understanding and inaccurate phrasings.
- It is observed that many students interpreted “encouraging greater use of mass public transport” as a form of education. While it is possible, it is not always the case. There are other approaches to encourage mass public transport such as subsidizing mass public transport.

Phrasing issues

There are often phrasing problems when explaining how market fails. The following phrasing shows conceptual errors, in particularly understanding the cost and effects:

- Deadweight loss ~~results in~~ the presence of negative externalities from the consumption of transport. *(Should be: is due to)*
- Overconsumption of transport ~~leads to~~ the presence of negative externalities / divergence between MSC and MPC. *(Should be: is a result of)*
- When consumers consume at the level where MPB=MPC as they disregard external costs, there is a divergence between MSC and MPC. *(Can be better phrased: When consumers disregard external costs, there is a divergence between MSC and MPC. Being self-interested they will consume transport at MPC=MPB)*

When explaining policies, it is important to make clear which market is the government intervening in e.g.:

- Government can ban (Ban what?)
- Government can impose tax (Tax what?)
  - Always remember to explain how much the tax is by stating that per unit tax should ideally be equal to MEC at Qs
  - Make sure that there is clear reference to well-labelled diagram. Often time students write about how curve shifts (e.g., MPC increases to MPC1; tax is equal to MEC at Qs) without any diagram drawn.

Content

Students generally have very superficial understanding of market failure resulting in very generic explanation of how policies work. There was little or even no application of economic theory when explaining how policies works. It is hard to pass such responses.

- Many students assumed that there is information failure in the consumption of public transport. Unfortunately, due to poor understanding of 1) information failure and 2) negative externalities as distinct sources of market failure, many of them erroneously conflate these 2 different sources in their explanation, resulting in inaccurate and erroneous analysis such as the following:
  - Education in the form of campaigns to encourage public transport usage could result in commuters internalizing external cost arising from the consumption of transport. Hence MPC increases towards MSC. This argument is incorrect on several counts:
    i. Based on theory, consumers will not consider EXTERNAL cost in their decision to use transportation given their self-interest. Hence education to encourage internalization of external cost is unlikely to be ineffective.
    ii. Assuming information failure in the case of public transport, this means that there is an underestimate their PRIVATE benefits from using public transport (i.e., $MPB_{perceived} < MPB_{actual}$). Hence, any intervention in the form of education should aim to increase $MPB_{perceived.}$
    iii. A possible approach to improve the argument is for students to assume that mass public transport and private transport are substitutes (i.e. 2 distinct markets). As commuters understand their MPB_{actual} of using public transport through education, they could switch from using private transport to using public transport. This reduces the use of private transport that produce carbon emissions, especially so if cleaner electric public transports are used. This reduces the divergence between MSC and MPC of private transport.
- A few students misinterpreted the market failure as a production issue rather than a consumption issue as stated in question. As such they discussed irrelevant policies such as tradable permits, imposing tax and quota on car production.

(f) With reference to Extract 3 and using your own knowledge, assess the consumer welfare impacts on point-to-point passengers following Grab's acquisition of Trans-Cab. [10]

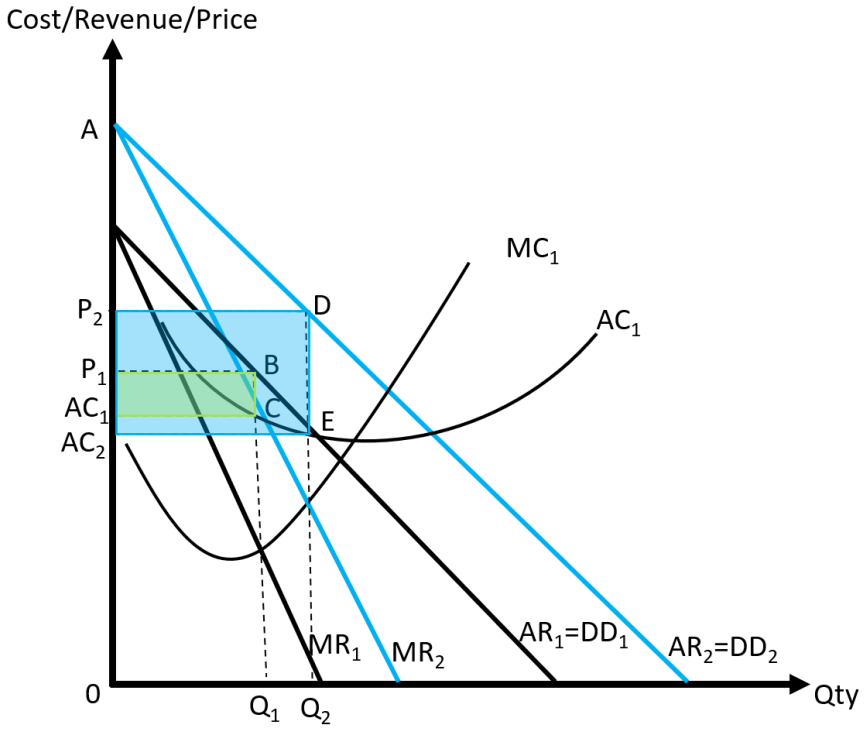
Requirement 1: Explanation on positive consumer welfare impacts on point-to-point passengers.

Lower price: Grab's acquisition of Trans-Cab might lead to internal technical EOS as operations are better streamlined. Extract gives evidence of greater efficiency afforded by an app which will be integrated with the mobile display units in Trans-Cab taxis which will help cabbies receive bookings from the Grab platform as well as Trans-Cab's existing call centre. The increased utilisation of the app across more passenger bookings will help to lower the AC of production. These cost savings might be passed on to consumers in the form of lower prices.

Higher quality of service. Surge pricing help to attract more drivers on the road The shorter grace period also means that more time is spent ferrying passengers to and fro from their destinations resulting in increased productivity as more ride bookings can be completed. Thus, passengers can be matched to their drivers quicker and more passengers will be able to complete their rides successfully.

OR

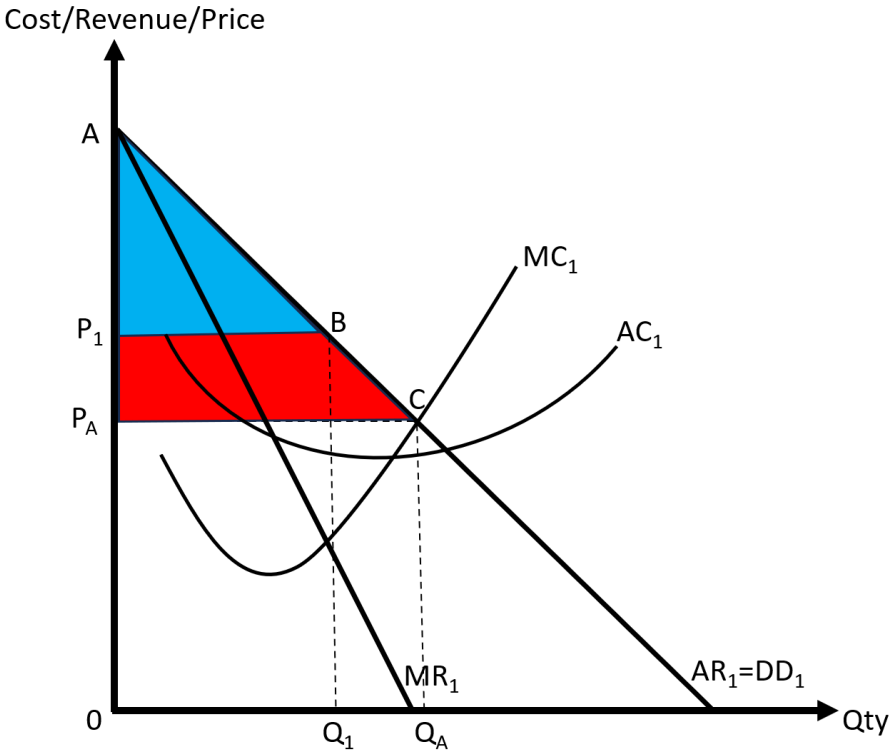
Higher quality of service. Grab's acquisition of Trans-Cab may mean that they have a larger market share. With an increased market share, the demand for their services will increase, and demand increases from DD_1 to DD_2 as shown in the diagram below. At the new profit maximising level of output where $MR_2=MC_1$, the firm will charge P2 and produce at Q2. This will allow them to earn a larger supernormal profit, as shown by the area P_2DEAC_2, which they can use to conduct R&D to improve the quality of its services thereby benefiting consumers.



Evaluation: In the short run, it is likely that Grab might pass on the cost savings to consumers in the form of lower prices via ride coupons. However, this might be done under the guise of increasing its market share. Moreover, this will probably cease in the longer term when Grab controls a dominant share of the point-to-point transportation market and then exert its market power in the form of higher prices.

Requirement 2: Explanation on negative consumer welfare impacts on point-to-point passengers.

Higher price: Extract gives evidence that drivers can now pick and choose their customers based on higher pricing. With surge pricing being implemented, there is a loss of consumer surplus as a result of higher prices. This can be shown by the diagram below at Point C where P=MC represents the allocative efficient outcome and consumer surplus is maximized as shown by triangle AP_AC. However, because of the presence of market power, the firm can maximize profits by setting output at MC=MR levels and set price at P_1 and output at Q_1. Consumer surplus is now reduced to the triangle AP_1B, and there is a loss of consumer surplus of P_1BCP_A.



Less choice: Extract gives evidence that Trans-cab's exit might mean less choices for passengers. If consumers are dissatisfied with the fares or quality of services offered by Grab, they now have less alternative available. Consumers would have no choice but to accept the abovementioned higher prices above or put up with the poorer quality services offered by Grab.

Evaluation: The negative welfare impacts may be mitigated by government entities such as the Competition and Consumer Commission of Singapore (CCCS) to prevent Grab from acquiring significant market power through mergers. Moreover, newer markets such as car-sharing have emerged, and consumers might substitute away from ride-sharing services such as Grab to car-sharing services such as GetGo if the quality and prices offered by Grab is no longer competitive.

L2 (5-7)	Developed and balanced explanations which assesses the positive and negative consumer welfare impacts, i.e. on price, quality and/or choice. Two requirements of the questions which are (1) positive consumer welfare impacts and (2) negative consumer welfare impacts are well explained with appropriate tool of analysis (e.g. with well referenced diagrams) and with good application to the context.
L1 (1-4)	Under-developed explanations of the requirements of the question, e.g. only 1 requirement well-explained or cursory explanations of 2 requirements. Answer shows some knowledge but does not show understanding of the requirement of the question, i.e. link to consumer welfare impacts. Basic errors of theory or an inadequate development of analysis may be evident. Where the answer is mostly irrelevant and only contain a few valid points made incidentally in an irrelevant context.
E2 (2-3)	Marks will be awarded for answers that considers evaluative judgements on consumer welfare impacts.
E1 (1)	Unsupported evaluative judgment.

Examiners Comments

Many candidates were able to interpret the question correctly to give a balanced answer on how consumer welfare might be impacted in terms of price, quality and choice. Poor answers simply regurgitated the information in the extracts without economic analysis. Candidates should be mindful to bring in as much economic analysis as possible and have sufficient scope in their answers on the various sub-topics. Better answers were able to explain iEOS, market power leading to an increase in AR/MR and show supernormal profits using economic diagrams.

There was a widespread recurrence of candidates interpreting “consumer welfare” to be the same as “consumer surplus” and did not differentiate them. Next, there was also a handful of candidates who were still unable to use the concept of PED to explain how an increase in price will affect quantity demanded (not demand). Diagrams were mostly poorer drawn with unlabeled axis, curves, or simply too small and messy to be read. Candidates should remember to include explanations using the diagram to further their economic analysis rather than just drawing it for the sake of drawing.

For evaluation, many candidates simply stated consumer welfare will increase or decrease without giving a further analytical explanation on why this might be. Better answers were able to evaluate using short-run and long-run outcomes, or bring in government policies that might help to protect consumers from being exploited.

Section B: Essay Questions

Essay Question 1
(Source: 2019 SAJC JC1 H2 FE)

Question 1:

Even as renewable energy sources are developing, crude oil remains an important factor of production for manufacturing industries such as plastics and services industries such as air travel. Rising crude oil prices have affected crude oil producers, producers of renewable energy sources and other producers that rely heavily on crude oil.

(a)	**Explain the factors that determine the price elasticity of demand for crude oil, the cross elasticity of demand for crude oil and price elasticity of supply for crude oil.**	**[10]**

Introduction
Price elasticity of demand (PED) for oil measures the responsiveness of quantity demanded for oil given a change in price of oil, ceteris paribus.

$$\text{PED} = \frac{\%\text{ change in quantity demanded for oil}}{\%\text{ change in price for oil}}$$

Cross elasticity of demand (XED) measures the responsiveness of demand for ol with given a change in price of a related good to oil (e.g. bio-fuel as substitute), ceteris paribus.

$$\text{XED} = \frac{\%\text{ change in quantity demanded for oil}}{\%\text{ change in price of bio-fuel}}$$

Price elasticity of supply (PES) of oil measures the responsiveness of quantity supplied of oil given a change in the price of oil, ceteris paribus.

$$\text{PES} = \frac{\%\text{ change in quantity supplied of oil}}{\%\text{ change in price of oil}}$$

Body
Value of PED for oil is likely to be less than 1. This is because oil is a necessity in our daily lives (e.g. petrol is needed by private car drivers) and a very important factor of production globally. Oil is used in the production processes of many goods and services e.g. plastic production, generation of electricity, air travel services. Hence, even if there is an increase in price of oil, the quantity demanded will fall less than proportionately generally.

<< Students can choose either substitutes or complements as a factor>>
Value of XED for oil depends on how close the relationship is between oil and a related good (i.e. substitute or complement). For example, bio-fuel could be a substitute to oil but not a close substitute. Hence even if price of bio-fuel were to fall, there will be a less than proportionate decrease in demand for oil. In this case, given that bio-fuel is not a close substitute to oil, the value of XED between oil and bio-fuel is a low positive value (i.e. positive, |XED| < 1).

On the other hand, natural gas and oil are typically used together in the generation of electricity. Hence they are close complements. If the price of natural gas were to fall, the demand for oil will increase more than proportionately. This mean the value of XED between oil and natural gas is a high negative value (i.e. negative, |XED|>1)

Lastly, the value of PES for oil could be bigger than 1 (i.e. PES >1). Oil are non-perishable and can be kept in barrels. There is an existence of inventories. Therefore, oil producers can increase quantity supplied of oil more than proportionately by releasing these inventories when there is an increase in price of oil.

However, overtime, due to depletion and the increasing difficulty to extract oil, value of PES could be smaller than 1 (i.e. PES <1). This is because even if price of oil increases, oil producers will find it harder to increase the quantity supplied of oil as it is harder to extract oil.

Conclusion
Above are the factors that determine the value of PED, XED and PES.

Mark Scheme

L3	- Correct definition and factors that determine PED, XED and PES. - Clarity in explanation and elaboration of the factors, while taking into consideration the context of oil. - Examples given are relevant and compelling. - All elasticities concepts are well-explained.
L2	- Correct definition and factors that determine PED, XED and PES. - There are some gaps in explanation and elaboration of the factors, while taking into considerations the context of oil - Examples given are relevant. - At least two elasticities concepts are well-explained.
L1	- Incorrect definition and factors that determine PED, XED and PES. - Answer is largely descriptive. The context of oil is not considered at all - Examples may be given, but explanations may be irrelevant. - There may only be one concept of elasticity that is well-explained.

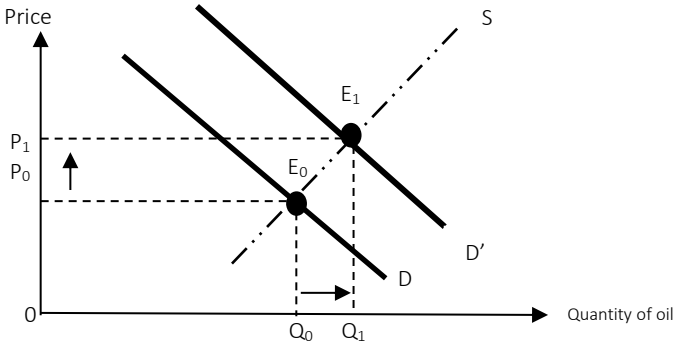
(b) **Assess the likely effects of the rise in price of crude oil on the revenue earned by crude oil producers, producers of renewable energy sources and other producers that rely heavily on crude oil.** **[15]**

Introduction
Revenue is calculated by multiplying the quantity of goods sold by the price of the goods. Oil is a very important factor of production globally. Several industries are heavily dependent on oil. However, there are also some that do not heavily depend on oil in its production processes.

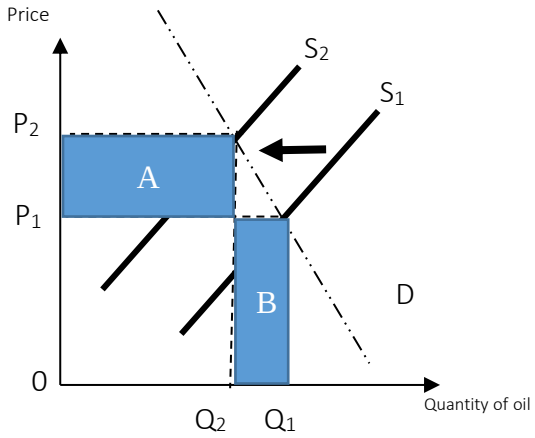
Body
The rise in price of oil is likely to increase the revenue earned by the producers of the oil industry. The rise in price of oil could be due to both demand and supply factors.

On the demand side, the rise in price could be due to an increase in demand for oil by emerging economies such as China and India. With reference to the diagram, an as

demand increase from demand D to D', it will lead to a rise in revenue from Area ($P_0 \times Q_0$) to Area (P_1 X Q_1).

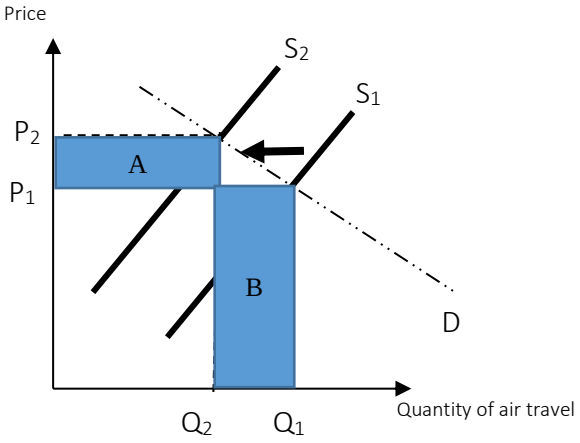


Rise in price of oil could be due to a fall in supply of oil. Oil producers could restrict the supply of oil to increase the price of oil. Given that demand for oil is price inelastic (i.e. PED <1) as it is a necessity in our daily lives and an important factor of production in many industries, the increase in price of oil will lead to a less than proportionate fall in quantity demanded for oil. This means that the increase in revenue due to the increase in price (Area A) will be greater than the fall in revenue (Area B) due to the less than proportionate fall in quantity demanded. Total revenue earned will increase.

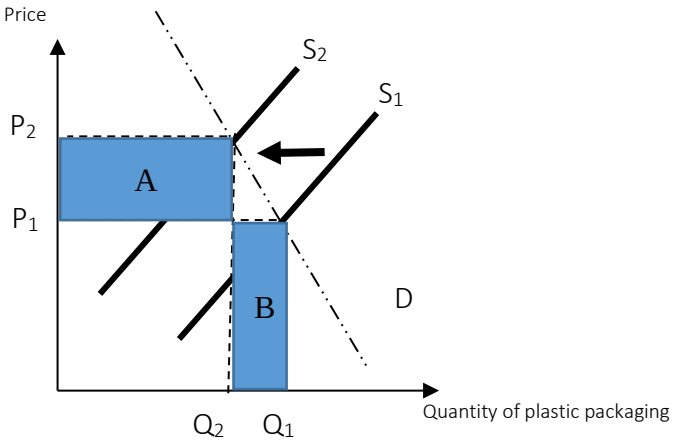


Industries (e.g. plastic packaging industry, air travel industry, electricity generation industry) that uses oil intensively in its production will face an increase in cost of production. However, given the value of PED for the goods and services they produce, they may face either a fall or increase in revenue earned.

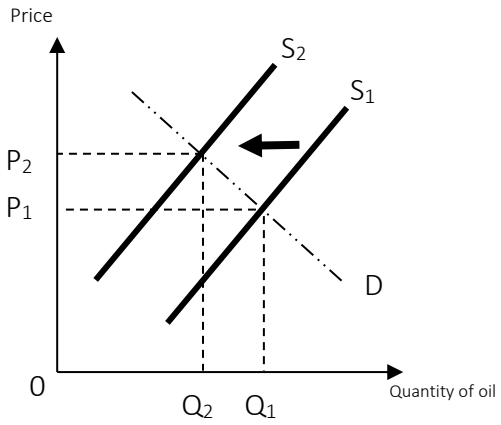
For example, industries that is oil intensive in its production but face a demand that is price elastic (i.e. PED>1) as they produce normal or luxury goods and services that takes up a large proportion of income, such as the air travel industry, will **earn less revenue**. Given the increase in cost of production, supply of air travel will fall and price of the air travel services will increase. As $PED_{air\ travel} > 1$, the increase in price of air travel will lead to a more than proportionate fall in quantity demanded for the air travel. This means the rise in revenue given the rise in price (Area A) will be smaller than the decrease in revenue (Area B) given the more than proportionate fall in quantity demanded. Total revenue earned will decrease.

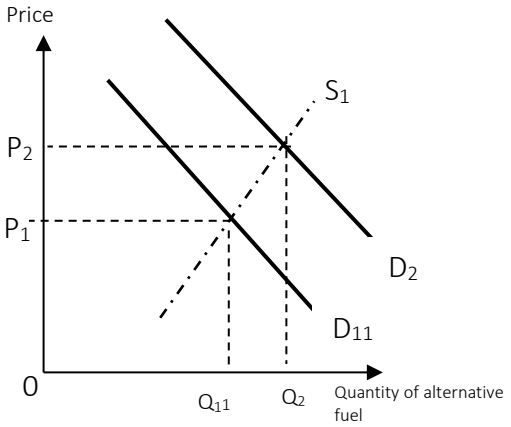


On the other hand, industries that is oil intensive in its production but face a demand that is price inelastic (i.e. PED <1) as they produce essential goods and services such as plastic packaging will **earn more revenue**. Given the increase in cost of production, the supply of plastic will fall and price of plastic will increase. As $PED_{plastic}$ <1, the increase in price of plastic will lead to a less than proportionate fall in quantity demanded for plastic. This mean that the rise in revenue given the rise in price will be bigger than the decrease in revenue due to the less than proportionate fall in quantity demanded. Total revenue earned will increase.



Industries developing and producing alternative energies to oil such as bio-fuel and renewable energy may earn more revenue. Notwithstanding the search for more environmentally friendly flights in light of climate change, the rise in oil prices may speed up the use of alternative energy sources for some industries that are oil intensive and face falling revenue given the higher oil price. For example, the air travel industry is exploring the use of bio-fuel and renewable energy for air crafts. As quantity demanded for oil falls, the demand for bio-fuel and renewable energy will increase. As demand for these alternative energy increases, industries producing them will enjoy an increase in total revenue from Area (P_1 x Q_1) to Area (P_2 x Q_2)





Conclusion/Evaluation

Revenue for oil industry will certainly increase given both the rise in oil price and that PED_{oil} <1. However, the size of the effects on revenue earned by producers of different industries mainly depends on 1) the industry's price elasticity of demand for its good/services and 2) how much oil is used in the production process by the industry. The more price elastic the demand for the good is (i.e. PED_{goodsX} >1) and the more oil intensive the production is, the greater revenue will fall.

However, these analysis are based on the assumption of ceteris paribus. Oil price is likely to affect political conditions and the health of economy. High oil price may slow growth globally. Slower growth is likely going to have knock on effect on different industries, even oil producing one. Crucially, global political events, and especially government policies, may turn out to be the major driving factor in what happens to revenue earned by industries.

Mark Scheme

L3	- Analysis on the impact of the rise in price of oil on the revenue earned by ALL three types of producers. - Explanations of how revenues can be affected are generally sound and accurate. - There are applications of the right economic concepts such as elasticity concepts, demand and supply. -

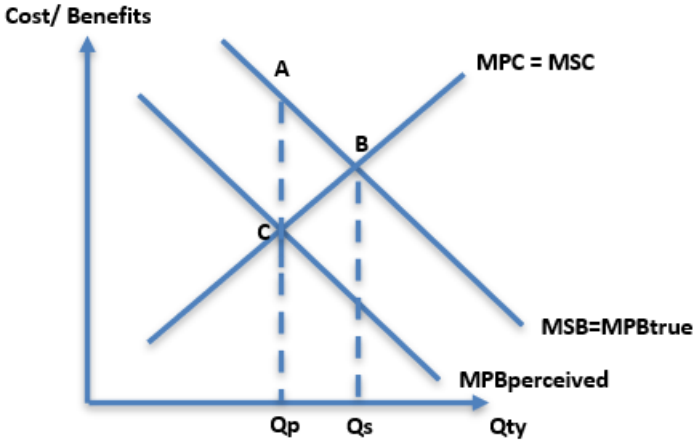
		L2	- Analysis on the impact of the rise in price of oil on the revenue earned by the at least TWO producers (oil producers and producer of one different industry; or producers of renewables and producers who heavily rely on oil for production) - Explanations of how revenues can be affected are generally sound but they may contain gaps and some conceptual errors. - There are applications of the right economic concepts such as elasticity concepts, demand and supply.	
		L1	- Attempt to analyse the impact of the rise in price of oil on the revenue earned by at least ONE producer. Analysis of revenue earned by producers of the other two industries may not be present. - Explanations of how revenues can be affected are conceptually inaccurate or lack clarity. - Answer is descriptive and lack the application of the right economic concepts such as elasticity concepts, demand and supply.	
		E3	A well elaborated comment that goes beyond how revenues of oil producers and producers of different industries are affected. There are also sound comments in terms of assumptions made, limitations of the theory used, time period etc.	
		E2	A well elaborated comment (e.g. comparison) on how revenues of oil producers and producers of different industries are affected.	
		E1	An unsupported statement on how revenues of oil producers and producers of different industries are affected.	

Essay Question 2
(Source: 2019 SAJC JC1 H2 FE)

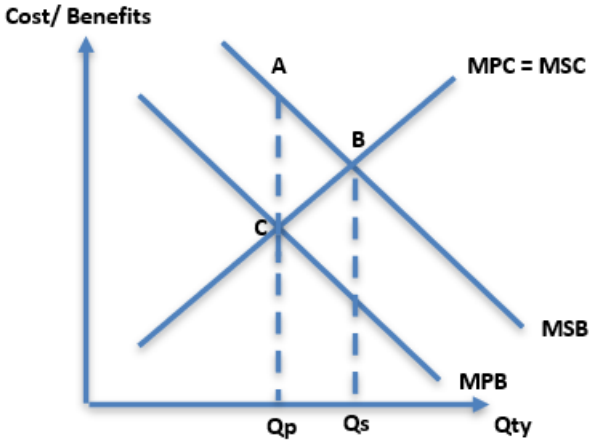
The main focus of the Government's expenditure is on the delivery of essential goods and services to Singaporeans to assure the nation of a secure future. Therefore, key areas of expenditure are on education, public housing, health care and national defence security. “The Government subsidises over 90 per cent of the total cost of educating our children. More has been done to support those from disadvantaged backgrounds by allowing more students to benefit from financial assistance," Finance Minister Heng Swee Keat said.

Source: *Various Sources*

(a)	**Explain why markets might fail in the case of education and that of national defence.**	**[10]**
	Introduction: • Education is considered by the Singapore government as a merit good that is socially desirable but if left to the free market would be under-consumed by the population. • National defence on the other hand is a good that has significant benefits to society but if left to the free market, it will not be produced at all due to its characteristics of being non-rivalrous and non-excludable in consumption. • The Singapore government’s decision to intervene in these two markets is to achieve their aims of efficiency and equity. This would help to ensure that resources are used efficiently and optimally and that there is fair access to essential goods and services. **Body 1: Positive Externality & Information Failure in Education** • Education in Singapore is considered a merit good as there is an underestimation of the private benefits of education. In addition, there are positive externalities when consumed. The combined result is an overall under-consumption of education. • Information Failure that leads to underestimating the private benefits of education could be due to parents not fully understanding how further education would lead to having better job prospects and much higher future income compared to going out to work now and the current income received. Such mind-set is particularly prevalent in lower social economic status families in Singapore. With reference to the diagram below, MPB (Perceived) is thus less than MPB(True).	



- When left to the free market, private equilibrium level of education is Q_P where MPB (Perceived) is equal to MPC as individuals seek to maximise their utility. Assuming no externalities present, the socially optimal equilibrium level of education should be higher at Qs instead where MSB is equal to MSC.
- Overall, there is an under-consumption of education by Q_P-Q_S number of years and thus over-allocation of resources.
- This results in allocative inefficiency and deadweight loss to society (Area ABC) as the benefits of increasing consumption by Qp-Qs amount to society of area QpABQs is larger than the cost to society of area QpCBQs.
- As a result of the under consumption of education, the Singapore government chooses to intervene in the market of education to ensure a more allocatively efficient outcome.



- In the market for education, there are also the external benefits from the consumption of education include active volunteerism, citizenry, and creation of employment for 3rd parties by the educated as they drive innovations and set up social as well as commercial enterprises. The better educated also contribute in terms of higher productivity which boost economic growth rates. Higher national income can better fund social projects which are beneficial to 3rd parties such as the under-privileged.

- The presence of external benefits causes a divergence between social and private benefits such that MSB is higher than MPB. (MSB = MPB + MEB).
- Private individuals only take into account of MPB and MPC, because they pursue only their self-interest and fail to internalize the external benefits.
    - Examples of private cost include school fees, cost of uniform and books, foregone earnings.
    - Examples of private benefits include education allows an individual to enjoy better job prospects (higher future earnings and career progression) which leads to a higher standard of living.

- When left to the free market, individuals would consume education up to Qp where MPC = MPB to maximise their utility while the social y optimal level of consumption is at Qs where MSC= MSB.
- Overall, there is an under-consumption of education by Q_P-Q_S number of years and thus over-allocation of resources.
- This results in allocative inefficiency and deadweight loss to society (Area ABC) as the benefits of increasing consumption by Qp-Qs amount to society of area QpABQs is larger than the cost to society of area QpCBQs.
- As a result of the underconsumption of education, the Singapore government chooses to intervene in the market of education to ensure a more allocatively efficient outcome.

Body 2: National Defence as Public Good

- Non-excludability
    - This means that once the good has been provided, it is impossible to exclude anyone from the benefits.
    - The benefit of keeping hostile states from attacking Singapore will benefit anyone who is in Singapore at the point of attack. It is not possible for this benefit to be enjoyed by a select few individuals in the country.
    - Since it is prohibitively expensive if not impossible to exclude others from consuming the good once it has been provided, this gives rise to the **free rider problem** - where it is possible for a person to consume a public good without having to pay for it.
    - From the demand side of the market, the desire to be a free rider weakens the incentive for consumers to offer to pay for public goods - no consumer will reveal his demand for national defence. Since there is no expression of demand, it is impossible to charge a market price for national defence. If such goods were to be left to the private enterprise, they would not be provided at all.
    - There is a **missing market**. The market failed because no resources will be allocated to their production.

- Non-rivalry

- This means that one person's consumption of a good does not reduce the amount available for others.
- Once national defence has been provided, one person's consumption of national defence (peace and security) does not mean that there is less for another person. Everyone is able to enjoy the benefit of peace that is being provided by national defence. If foreign invasions are successfully kept at bay, Singapore enjoys peace regardless of population size.
- This implies that once national defence is provided, the additional cost to provide for another person to benefit from consuming the product is zero. Marginal cost of an additional user is zero. The property of non-rivalry also means the marginal cost of admitting one more user of the good is zero. Since marginal cost of admitting one more user is zero for a public good, at socially optimum output which occurs when MSB = MSC, the socially ideal price will be zero.
- Profit maximising private firms will have to charge a price in order to produce the good and hence would not be willing to set zero price. Hence allocative efficiency cannot be achieved

- As such, the Singapore government needs to intervene to provide the public goods at socially optimal level by financing such expenditure out of taxation.

L3	Clear and developed explanation of the reasons why Singapore government intervenes in the provision of national defence and education, i.e. able to identify and explain the 2 characteristics of public good with reference to national defence as well as the two possible sources of market failure in the market of education.
L2	Under-developed explanation of the reasons why Singapore government intervenes in the provision of national defence and education. For example, answers may contain explanation of only one characteristic of public good with reference to national defence and/or the two possible sources of market failure in the market of education.
L1	For an answer that may show some knowledge of the reasons why Singapore government intervenes in the provision of national defence and education but contains mostly unexplained statements, containing major conceptual errors

(b)	**Discuss whether the provision of subsidies by the Singapore government is the most appropriate policy in addressing the market failure in the education market.**	**[15]**

Part (b)

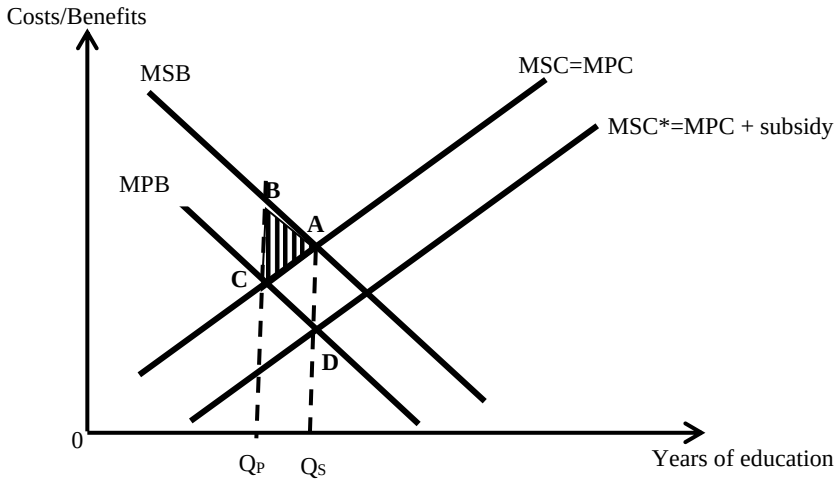
Introduction:

- To deal with the issue of market failure in education, education in Singapore is heavily subsidised.

Body:

Indirect Subsidies

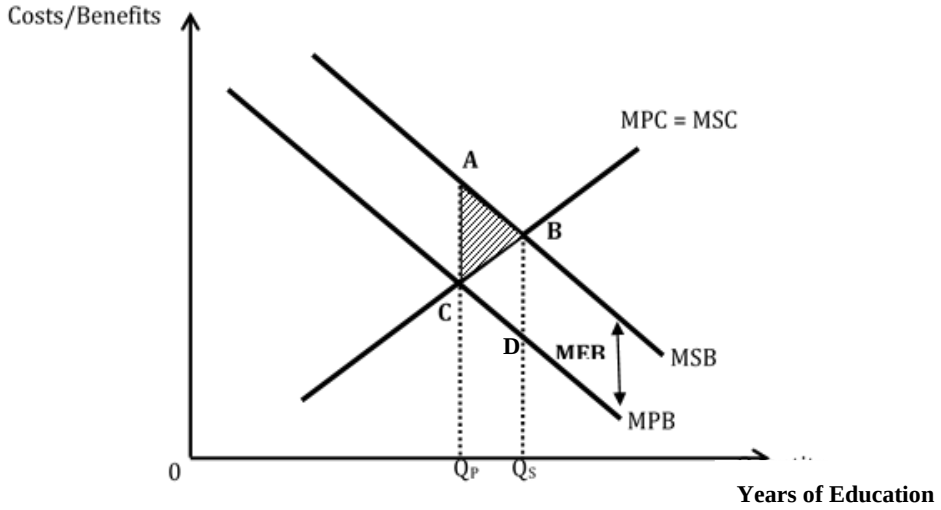
- The Government subsidises over 90 per cent of the total cost of educating our children. These are indirect subsidies, which are provided to the producers and help to lower the cost of production for education services. Assuming that producers pass on the cost savings to consumers in terms of lower fees for education, the indirect subsidy would reduce the private cost of education to individuals and hence the MPC would shift to MPC+Subsidy.
- Ideally, the amount of indirect subsidy provided would be equivalent to the distance AD which is the marginal external benefit at the socially optimal level of education. This is so that the private level of years of education will be now at Qs



- Evaluation: Direct subsidies have limitations.
  - Poor Information give rise to problems in measuring the size of the external benefits and hence the amount of subsidy needed to correct the market failure.
  - While school fees are free at the primary level and fairly low at the secondary and pre-university levels, families from the lower income bracket may still struggle to pay the miscellaneous fees as well as examination fees which are quite hefty. However, the government has in place financial aid schemes to help those who are in need of more help. Students who come from families where the gross household income is less than $2500/ month can apply for financial assistance that will cover textbooks, school attire as well as examination fees.

Direct Subsidies (Eg. scholarships, bursaries, Edusave grants)

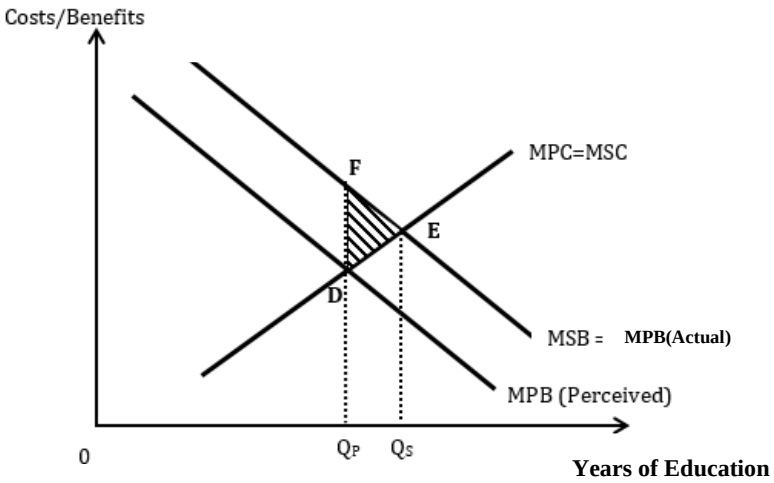
- Subsidies can also take the form of direct subsidies. These take the form of various scholarships, bursaries and the Edusave grant. These scholarships and Edusave grants would act as a direct subsidy to students. With these direct subsidies, Singaporean Students will be able to enjoy school enrichment activities and maximise the opportunities they would get from the education system.
- The amount of direct subsidy provided should be equivalent to the distance BD which is, again, the marginal external benefit at the socially optimal level of education. This will result in a rightward shift of the MPB curve to coincide with the socially optimal level of output.
- Evaluation: Similar to direct subsidies.



Increasing awareness on the true private benefits of education.

Subsidies (indirect and direct) seek to correct the market failure due to the presence of positive externalities in consumption of education. This is because subsidies allow private consumers to internalize the external benefits and to be incentives to increase consumption of education.

However, one of the reasons why education is under-consumed is due to information failure, where parents, especially those with low social economic status, are unaware of the true benefits of education. For these parents, even if school fees were not an issue (since fees could already be highly subsidized), they may not be fully aware of the full private benefits of education and their immediate concern would be to have their children work to help support the family instead. Therefore, to close the information gap, it is necessary for the government to provide support by creating platforms, deploying counsellors and social workers to help them understand the true private benefits of education, so as to encourage them to keep their children to school longer. This will increase MPB(Percieved) to MPB(Actual).



- Evaluation:
  - Mind-sets and behaviours are hard to change. Those of disadvantaged background are understandably more concerns about their immediate financial needs. Therefore parents are more unlikely to be able to keep their children in school and require them to start work early to help with the financial needs of the family. Hence such policy takes time to come into effect.

Legislation: Compulsory Education Act

- Given that the policy to increase awareness of the true private benefit of education take time to be effective, education is made compulsory for children who are above the age of 6 years and who have not yet attained the age of 15 years.
- In order to prevent ignorant parents who don't fully understand the true value of education from not sending their children to primary and secondary schools, the government has to set laws on compulsory education so that all children will receive at least ten years of general education.
  - *Evaluation:* Students who are disinterested in studies are kept in school. This is a waste of scarce resources. Hence, this may not be economically efficient as there is a misallocation of resources.
  - *There is additional costs involved in enforcing the law. Resources will be need to be spent on monitoring that every child is attending school, contacting parents who fail to register their children for school and taking the appropriate action for non-compliance. The benefits of enforcing the law have to be weighed against the opportunity costs of the resources spent on it.*

<u>Direct Provision</u>

- Besides policies such as subsidies, education to increase awareness of the true private benefit of education and legislation (Compulsory Education Act), the Singapore government is the principal provider of education at primary, secondary and tertiary levels.
- Schools are directly build and funded from the government budget and run according to policies and guidelines from the Ministry of Education (MOE) to ensure the availability as well as the quality of schools for the students to study.
- Direct provision helps to ensure there is adequate supply of schools to meet the needs of the population. With its information on the number of births in each year and size of each cohort, the government is able to plan the number

of school places required and allocate the appropriate amount of resources for the provision of education in Singapore.

- The direct provision of education also helps to ensure that students offered quality curriculum, with a common set of values that will allow the government to achieve broader goals such as nation building.
    - *Evaluation:* Government provided education may be seen as being less effective and of a lower quality than private education systems. However, in the context of Singapore, schools are under a system that has checks and balances to ensure that quality teaching and learning takes place. This is evident in the consistently high ranking of Singapore students in international testing such as TIMSS and PISA.
    - While the government can ensure that there is adequate supply of school places, it may be difficult to determine the optimal extent of provision eg. what is the optimal classroom size and teacher-student ratio?
    - It is also difficult to assess the quality of education in terms of the intangible aspects such as personal traits and soft skills. Eg. to what extent has the education helped students to become more resilient and creative? Beyond academic results, it is difficult to determine the extent to which education has equipped students with the skills and attributes needed in the workforce in future.

Conclusion:

While subsidies are appropriate to increase the consumption of education especially for students of low social economic status, subsidies alone are not enough. Subsidies only help to address the presence of positive externalities as a source of market failure generally.

- Even so, to be more effect with subsidies, government has to consider different levels of education eg. primary, secondary and tertiary. While subsidies are appropriate, the extent of provision for different levels of education must be constantly reviewed. Eg. amount of subsidies required for tertiary education vs secondary education. Should more direct subsidies eg. scholarships be given for certain courses that are important for Singapore's future?

All in all, Singapore government actively uses a suite of policies to ensure that different issues related to education. Education of parents is a policy to increase understanding of the full private benefits of education, legislation is to address time-lag/difficulties in behavioral changes that come with education of parents sources of market failure are addressed and direct provision seek to ensure quality education.

Level	Knowledge, Understanding, Application, Analysis
L3	- For an answer that provides rigorous assessment of subsidies and at least one other policies. - Policies address **BOTH** sources of market failure in the case of as a merit good i.e. presence of positive externalities and underestimation of private benefits - Clear and accurate discussion of at least 2 polices.
L2	- For an answer that provides rigorous assessment of subsidies and at least one other policies. - Policies **may not address BOTH** sources of market failure in the case of as a merit good i.e. presence of positive externalities and underestimation of private benefits. - Discussion of at least 2 policies. However, explanation could be underdeveloped or contain some gaps and inaccuracies.
L1	- For an answer that merely states a few points on how indirect subsidies or other policies work with little economic reasoning or many conceptual errors. - Answer is generally descriptive.
E3	A well-reasoned judgement on the most appropriate measure in the education market in the Singapore context and insightful considerations of the economic situations that the Singapore market might face in the long run.
E2	For an unsubstantiated/ unexplained judgement.
E1	For an unexplained conclusion or evaluative comment.

Essay Question 3
(Source: 2019 SAJC JC1 H2 FE)

To increase profits, firms may adopt strategies like price discrimination.		
(a)	**With the use of examples, explain what price discrimination is and the conditions necessary for it to be successful.**	**[10]**
	Introduction: Price discrimination (PD) is the practice of selling an identical product at different prices to different consumers and these price differences ***are not caused by cost differences*****.** **Conditions for successful** PD include 1) Firms must have price setting ability, 2) Resale is not possible, 3) Market can be segmented (PED must differ in each sub-market) ***Body:*** **Condition 1: Firm must have price setting ability; control over market supply** - Market dominance gives firms price setting ability such that when they raise price during price discrimination, consumers still have to purchase from them as there are few other alternatives. - Oligopolies and monopolies that function in markets with high barriers to entry are able to set own prices. This also give them the ability to conduct price discrimination. - Example: Movie Theatres (e.g. Golden Village, Shaw and Cathay) in Singapore functions in an oligopolistic market structure. Therefore, each has substantial market share which gives it the ability to set its own prices. **Condition 2: No possibility of resale** - No means of resale keeps prices discriminated. If consumers can buy in the cheaper market and resell in the more expensive segment, the demand in the cheaper market increases to raise price and demand in the expensive segment falls to reduce price. Eventually, sellers lose ability to price discriminate. - Example: Adults are not allowed to buy student or senior tickets or they will be subject to fines. ID and photos checks as well as identification numbers on tickets prevent any resale of transference and prevent resale. **Condition 3: Segmentation of markets makes price discrimination profitable** - Firms must be able to segment markets practically such that each sub-market has different PED in order for different prices to be charged. - Markets may be separated by using of concessionary passes issued to different consumer groups for payment, or by packaging the same good differently to target different groups. Examples: - Difference in price arises because of difference in PED	

- Low PED → working adults less responsive to price changes, ∴↑price → less than proportionate ↓Qd → ↑revenue → ↑profits.
- High PED → students and seniors more responsive to price changes, ∴↓price → more than proportionate ↑Qd → ↑revenue → ↑profits.
- I.e. 3rd degree price discrimination
  - Example: Cheaper movie tickets for senior citizens and students while working adults pay full fare
  - Senior citizens and students have lower income levels, therefore expenditure on movies takes up higher proportion of income, resulting in their higher PED as compared with working adults. Working adults who can watch movie only on certain time of the day/week and spend a smaller proportion of their income on public transport
  - No difference in cost of showing a movie between a senior citizen/student and a working adult.
- If the same good is charged differently due to cost differences, then it will not be a form of price discrimination. E.g. student/senior privileges is a result of a lower operating cost during certain time of the day/locations, then it is not a case of price discrimination.

Conclusion:

- Differences in PED underpin the concept of setting different prices for the same good, even though the cost of producing the good is the same.
- Control over market supply and prevention of resale makes price discrimination possible, but it is the ability to segment the market based on PED that makes it profitable.

Mark Scheme

L3	- Well-developed explanations of both definition and conditions - Clear and good examples of different types of price discrimination that are clearly elaborated upon - Able to distinguish between what makes price discrimination profitable and what makes it possible (Diagrammatic illustration of price discrimination is not necessary.)
L2	- Correct definition and conditions of price discrimination. Explanations contain some gaps and there may be insufficiency in elaboration.
L1	- Incorrect definition and conditions of price discrimination; OR - Correct definition of price discrimination and statements of conditions, but incorrect explanations of concepts and conditions

(b)	**Discuss whether a firm's strategies to increase profits come at the expense of consumers' welfare.**	**[15]**

Introduction

- Profits are measured by the difference in total revenue – total cost.
- Strategies to increase profits are behaviours or decisions in terms of price and output that increase revenue and/or decrease cost
- Consumers' welfare can be assessed by analysing in terms of price (affordability and accessibility, consumer surplus), quality and choice.

Body

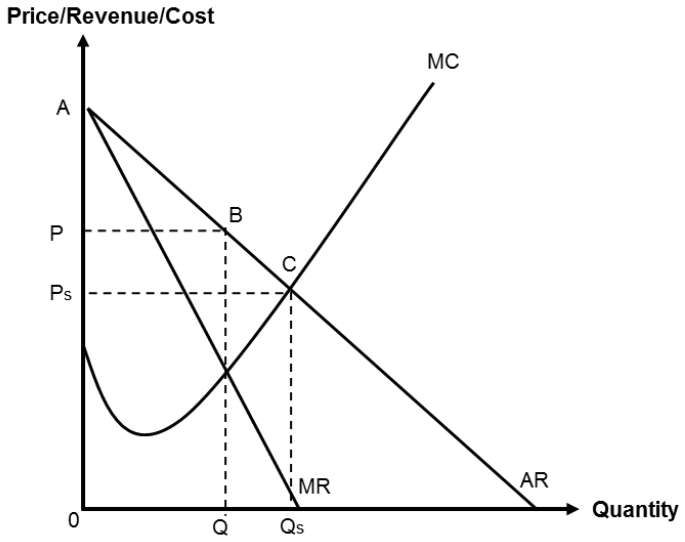
<u>Thesis: Business strategies have negative impacts on consumers' welfare</u>

Firms' foremost strategy is to ensure that their price and output decisions maximises profit (i.e. MC = MR) given the prevailing revenue and cost conditions they face

Set output where Marginal Revenue (MR) = Marginal Cost (MC), as this maximizes profits.

  - MR>MC → more profits to be gained with additional unit sold → decision is to increase output
  - MR<MC → incurrence of additional cost with additional unit sold → decision is to reduce

- With reference to figure below, profit-maximising output level is at Q. The maximum price consumers would pay for Q is P. Setting price P for output Q maximizes profits.



- However, prices are higher compared to the market price. The free market would result in a price that maximizes society's welfare, where P=MC. Therefore, the free market equilibrium price and output would be at Ps and Qs.

- Because of the firm's decision to profit-maximise instead of take market prices, prices are higher at P compared to Ps. Quantity produced is lower at Q compared to Q_S and consumer surplus is also lower at APB compared to AP_SC. This represents less affordability, less accessibility, and less surpluses for consumers.
- This represents some degree of inequity too.

Firms could conduct price discrimination to increase their profits at the expense of consumers

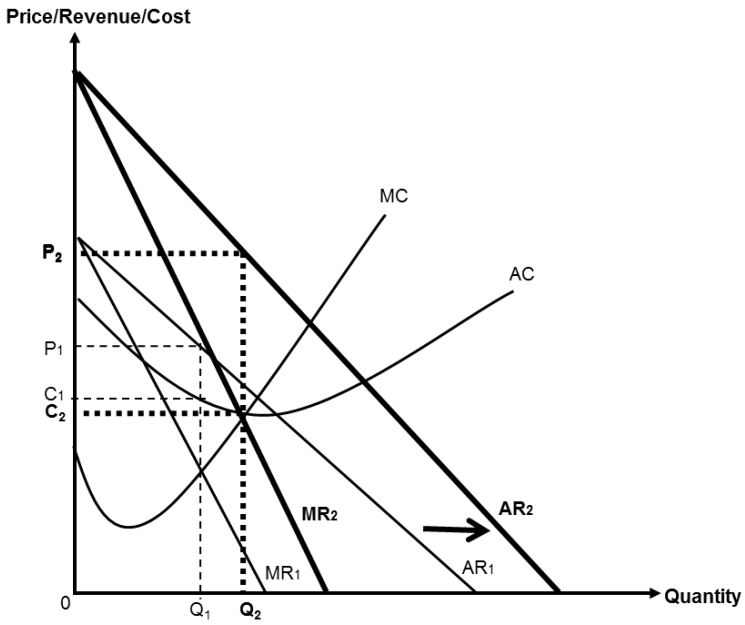
- Price discrimination help firms to increase revenue, which would increase profits at the expense of reduced consumer surplus.
- Example: Because of price discrimination, adults are charged higher prices for public transport services compared to students and senior citizens. The adults' demand for public transport is more price inelastic and a rise in price would result in a less than proportionate fall in quantity demanded. Therefore, firms experience greater revenue as a result of setting higher prices for them. This is at the expense of the adults who pay higher prices for public transport, reducing their consumer surplus.

<u>However,</u>

- Even though overall consumer surplus falls in the market, some consumers get to benefit from price discrimination. These are consumers with higher PED, who get charged lower prices and experience greater availability of goods.
- Example: Students and senior citizens would be charged lower prices by firms since they have price elastic demand and will increase quantity demanded more than proportionately when price is reduced.

Firms may also increase profits by using false advertising to create imaginary differences to their products, which cause consumers to pay more without any real changes in the utility they enjoy

- Falsely advertising products to create imagined product differentiation alters taste and preference of consumers to increase demand (↑DD) and reduce substitutability (↓PED) of a firm's products. This is possible because of asymmetric information, where producers know the true benefits their products given to consumers, but overstate it through advertisements and marketing efforts.
- With reference to the diagram below, revenue conditions are expected to improve with advertising. This is represented by a shift of AR from AR_1 to AR_2 . Profits rise as a result of the greater and more price inelastic demand, from $(P_1 – C_1)Q_1$ to $(P_2 – C_2)Q_2$.



- However, consumers face an increase in price from P_1 to P_2. Although, they can now purchase more quantities from Q_1 to Q_2, there is no real increase in utility for them since there is no change in the quality of the product.
- Example: Weight-loss services provided by weight management firms tend to overstate the reduction in weight their consumers can achieve through their programs. They do so with pictures of celebrities or selected success stories advertised in public places. Consumers pay high prices for these services, but may not experience the weight loss they had expected to experience when they registered for more sessions of the program.

Firms may collude by fixing prices to increase their profits at the expense of consumer welfare

- Typically, a firm that raises prices will experience fall in quantity demanded as consumers will switch to alternatives when they observe rising prices. However, if all firms collude, the firms will behave like a monopoly and increase their ability to increase price and restrict output.
- Consumers pay higher prices, reducing consumer surplus. There will also be less access to output in the market as output could be restricted as part of the collusion.
- Example: Dominant poultry suppliers in Singapore are suspected of fixing prices for the last 7 years. If this is true, consumers would have been paying much higher prices for poultry, having their surpluses exploited by these firms in the form of higher profits.

Firms may merge with or acquire other firms to increase their profits at the expense of consumer welfare

- Merger increases market dominance which will exacerbate the effects of a dominant firm profit's maximization strategy described earlier. This is because

greater dominance gives firms greater price setting ability to raise prices much higher than the market level.

- Consumers suffer from increase in prices and loss of consumer welfare as compared with if the market had been more competitive.
- Example: The acquisition of Tigerair by Singapore Airlines would give Singapore Airlines more dominance in the airline industry, such that consumers can be charged higher prices for SIA's flights within Asia but not have Tigerair as a cheaper alternative to turn to.

However,

- Merger and acquisitions increase the scale of firms which will allow them to reap international economies of scale, that they may choose to pass on to consumers should they opt to engage in price competition instead of setting prices at their profit-maximising equilibrium.

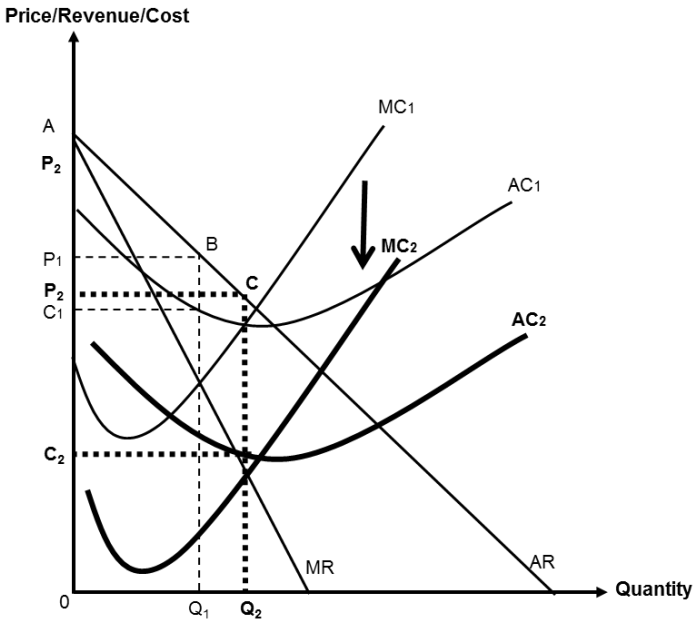
Anti-thesis: Business strategies have positive impacts on consumers' welfare

To raise profits, firms develop real product differences through improving quality of consumer products

- Real product differentiation through R&D → ↑ DD since taste and preferences are altered to favour innovative products and ↓PED because of reduced substitutability of novel product
    - With reference to Figure 2, profit for firms increase from $(P_1 – C_1)Q_1$ to $(P_2 – C_2)Q_2$ when revenue conditions improve.
- Although consumers pay a higher price of P_2 compared P_1, the higher price is justified by the improvement in quality of their purchase. Consumers enjoy choice of new goods and/or goods that are of better quality.
- Example: Apple transforming feature phones to smartphones with the iPhone, increasing its own profits and also benefitting consumers who get to enjoy better information and communication technology.

In a bid to increase profits, firms may innovate processes, which can lower prices for consumers if they pass on the cost savings

- Process innovation occurs when firms improve production process through researching and development better technology for production → lowers variable cost of production
- With reference to diagram below, the improved cost condition is illustrated by the shift from AC_1 and MC_1 to AC_2 and MC_2 such that equilibrium output increases from Q_1 to Q_2. Profits rise from $(P_1 – C_1)Q_1$ to $(P_2 – C_2)Q_2$ despite fall in prices from P_1 to P_2 because process innovation reduced cost more than the reduce in price.



- Consumers enjoy lower prices at P2, greater quantity of Q2 and also greater consumer surplus of AP2C as compared to AP1B.
- Example: Better technology that makes use of fuel for flights more efficient, reducing cost of producing flights has helped flight operators make more profits, while increasing affordability and availability of flights for consumers.

Firms may engage in price competition or even price wars to increase profits in the long-run, reducing price for consumers

- Firms decide not to price at their equilibrium, but to lower prices below what is optimal for them with the hope of outcompeting rivals and driving them out of the market
- While they lose profits in the short-run since price is not at the profit-maximising equilibrium, in the long-run, they can experience greater demand (↑DD) and price-setting ability (↓PED) if they successfully entrench their market dominance. Improved revenue conditions will increase their profits.
- Consumers enjoy lower prices meanwhile.

However,

- This strategy would be at the expense of consumers' welfare in the long-run as greater market dominance in future will allow firms to restrict out and raise prices, increase prices of less available products for consumers. There will be less consumer surplus.

Evaluative conclusion

- No clear answer to whether business strategies are conducted at the expense of consumers' welfare; profit motives can sometimes go hand-in-hand with enhancing consumer welfare.
- The best strategies for society are strategies involving research and development that innovates new products or processes. These strategies will

increase profits of firms and welfare of consumers. This is consistent with the economic intuition that improvements in technology typically benefit society.

- Whether or not a firm can engage in such win-win strategies depends largely on the willingness and ability of firms to conduct R&D. Firms that experience competition or face contestable threats are typically more willing, while firms that earn large supernormal profits would be more able. Thus, competitive oligopolies are most able to conduct R&D as a business strategy that increases its profits while benefitting consumers.

Mark Scheme

L3	- Clear understanding of price and non-price business strategies to increase profits - Clear yardsticks defined for consumer welfare - Balanced discussion that shows how consumer welfare can be both positively and negatively affected for **at least 2 business strategies** - Clear use of economic framework in explaining how the increase in profits could both positively and negatively affect consumer welfare - Relevant and clearly explained examples used - Links to part (a) with the inclusion of price discrimination as a strategy
L2	- Clear understanding of either price or non-price business strategies to increase profits - Clear yardsticks defined for consumer welfare - Discussion that shows how consumer welfare can be either positively or negatively affected for **at least 2 business strategies** - Explanations of how business strategies affect profits and consumer welfare are correct and made use of appropriate economic framework, although underdeveloped due to minor gaps in explanations or lack of elaborate examples
L1	- Analysed different types of market structures instead of different price and non-price business strategies - OR Relevant business strategies described, but explanation of how they affect profits and consumer welfare is missing, conceptually inaccurate or very unclear - Incorrect yardsticks for consumer welfare, such as only using various efficiencies to assess consumer welfare
E3	A compelling judgement on how business strategies can be both beneficial and harmful to society, depending on the types of strategies and conditions present. Judgement is well substantiated with analysis and examples.

	E2	A judgement on whether business strategies are beneficial or harmful to society, substantiating with analysis and examples.	
	E1	An unexplained judgment on whether profit motives always result in loss of consumer welfare	

Essay Question 4
(Source: 2020 SAJC JC1 H2 FE)

Global rice prices are expected to increase sharply by 2050 due to factors ranging from a rise in world consumption, greater use of rice feed for animal feeding, to falling crop yield levels caused by bad weather conditions in major rice-producing countries. Price ceiling is frequently used as a measure by governments to ensure affordability of essential food staples such as rice.

(a) Explain why global rice prices are expected to increase sharply. **[10]**

(b) Discuss whether the use of a price ceiling is the best measure that can be adopted by a government to keep rice prices affordable. **[15]**

Part (a)

Command word	Explain
Content	Rice prices → use DD/SS analysis Increase sharply → PED and PES analysis needed
Context	Global

Introduction

- In any market, the price of the good is determined by the interaction of demand and supply forces. At the market equilibrium price, the quantity demanded is exactly the same as the quantity supplied, suggesting that there is neither surplus nor shortage in the market.
- The increase in global rice prices can be explained by an increase in global rice demand coupled with a decrease in global rice supply.
- Given that rice is a necessity, its price inelastic demand would cause global rice prices to increase sharply when there is a decrease in global rice supply.
- In addition, with rice having a price inelastic supply due to its long gestation period, any increase in global rice demand will cause global rice prices to increase sharply.

Body

1. Explain demand factors and why PED<1

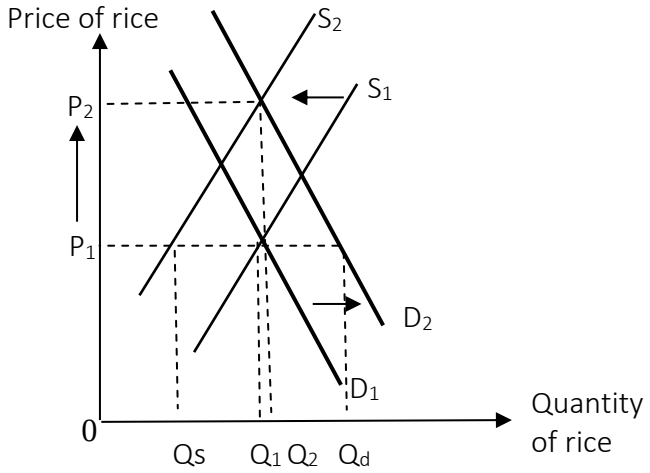
- As mentioned in the preamble, global rice demand has risen due to an increase in world consumption, possibly caused by an **increase in world population size or income.** With rice being a normal good, an increase in household income would cause consumers to demand for more rice. This is particularly true in large emerging economies such as China and India where both purchasing power and population size have been rising in recent years.
- Also, there has been greater use of rice for animal feeding. This means that rice is used as a factor of production for animal rearing. This also contributes to the increase in demand for rice as farmers will require more rice to rear animals to meet the rising consumption levels for meat.
- **Furthermore, demand for rice is price inelastic as it is a necessity required for survival and a staple food for most Asians.** Any increase in price due to changes in supply will therefore only bring about a less than proportionate decrease in quantity

demanded, ceteris paribus. To clear the shortage at the original equilibrium price, global rice prices will end up rising sharply.

2. Explain supply factors and why PES<1.

- As mentioned in the preamble, there has been a **fall in crop yields** in major crop-producing countries. This could be due to factors such as poor weather conditions affecting harvest and falling land productivity.
- **With all agricultural food items having long gestation period, the supply of rice is price inelastic** as rice producers are not able to increase rice production immediately in response to an increase in price caused by an increase in demand. This means that an increase in price will only cause quantity supplied to increase less than proportionately, ceteris paribus. Hence, global rice prices will end up rising sharply.

Figure 1: Global Rice Market



3. Explain the combined impact of supply and demand shocks on global rice prices

- The increase in global rice demand (shown by the rightward shift of the demand curve from D_1 to D_2) coupled with price inelastic supply, as well as the decrease in global rice supply (shown by the leftward shift of the supply curve from S_1 to S_2) coupled with price inelastic demand, will cause a **huge shortage (Qd – Qs)** at P_1. In light of this huge shortage, it exerts an upward pressure on price, causing Qd to decrease less than proportionately (PED <1) while Qs to increase less than proportionately (PES <1). Due to this less than proportionate decrease in Qd and less than proportionate increase in Qs, a sharp rise in global rice prices from P_1 to P_2 is required in order to clear the shortage causing equilibrium quantity to rise minimally from Q_1 to Q_2.

Conclusion

Therefore, due to the combined effect of increase in demand and fall in supply, coupled with the price inelastic nature of both demand and supply, prices are expected to rise sharply.

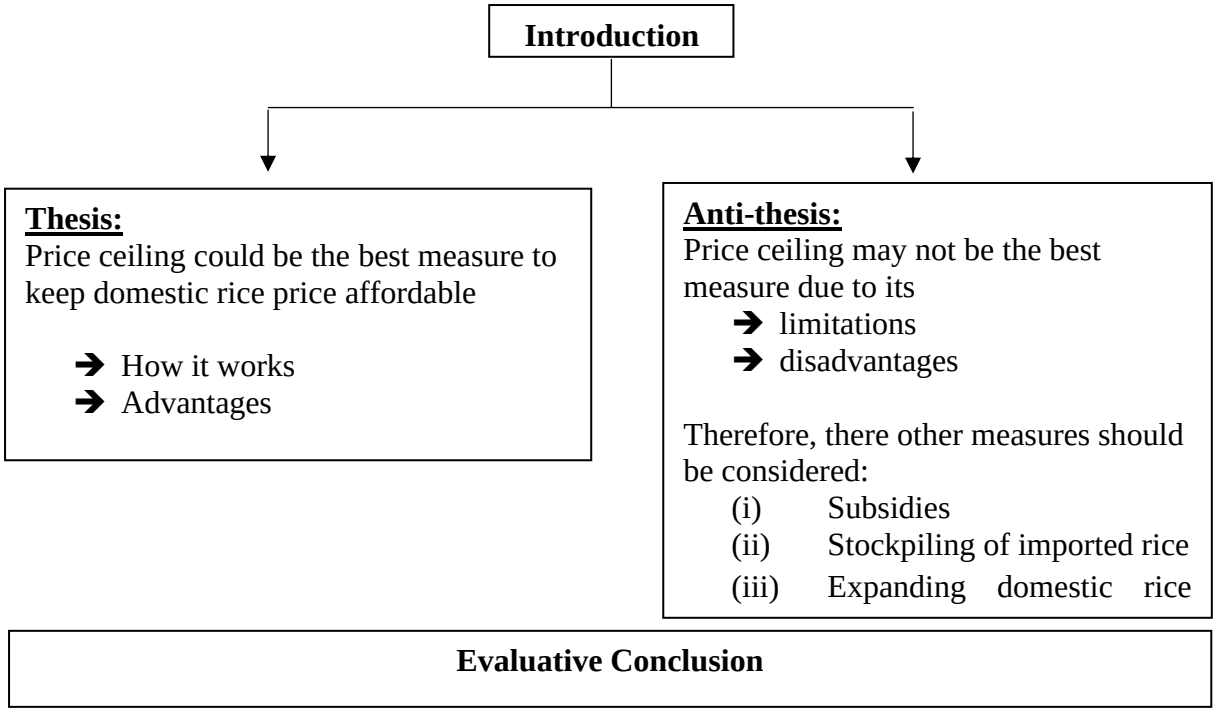
Level	Knowledge, Application/Understanding/Analysis	Marks
L3	Well developed explanations of both non-price determinants of SS and DD Answer shows an awareness of how PED<1 and PES<1 affects the extent of price change	8-10
L2	Explanations of both non-price determinants of SS and DD present but may not be well-contextualised to the events in the preamble. Answer shows limited awareness of how PED<1 and PES<1 affects the extent of price change No mention of PED<1 and/or PES<1 causing sharp price change → cap at 5m	5-7
L1	Descriptive narration of DD and SS factors. Invalid links to market equilibrium price.	1-4

Part (b)

Question Analysis

Command word	Discuss
Content	Price ceiling → Pmax Best measure → at least 2 other policies needed Aim of policies → keep rice prices affordable
Context	Singapore, rice price

Schematic Plan



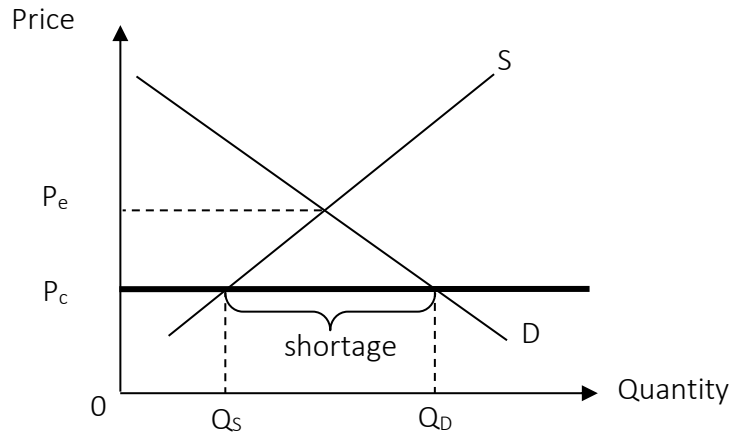
Introduction

Price ceiling is defined as the highest permissible price the producers can legally charge **and it is implemented by many governments to ensure affordability of essential goods such as rice. It can be one of the measures adopted by a government but there are also other possible measures available such as subsidies, and supply-side policies to ensure affordability of rice in the long term.**

Body

Thesis:

Price ceilings could be the best measure to keep rice price affordable. It is usually implemented with the aim of keeping prices down when there is inflation (sustained increase in general price level) or when prices are expected to rise sharply (explained in part a) – in order to protect low income families and to ensure that necessities are affordable. This is for equity reasons, to ensure fairness in the distribution of goods and services. How it works can be illustrated in the diagram below:



The intended outcome of the price ceiling is to keep prices lower than what is established by the price mechanism ($P_c < P_e$). An effective price ceiling must be set at a level below the market equilibrium price. With a price ceiling in place, consumers will be able to buy rice at Pc even when free market sets the price at Pe. This ensures affordability of rice.

Anti-thesis:

However, price ceiling may not be the best measure due to its limitations and disadvantages. The shortage created (Q_SQ_D) means that some consumers are able to consume Q_S units of the good at the lower price of P_C, while there are consumers who cannot enjoy the good. These consumers might consequently turn to the illegal black market to obtain the good by paying higher prices. The creation of a shortage and the resultant black-market due to the price ceiling could actually deprive the low-income group of basic necessities and render the price ceiling ineffective in protecting low-income families.

In the event of a shortage, an alternative mechanism for rationing the goods and services might be needed. This can take the form of coupons, or allocation based on a first-come-first-served basis. Suppliers might also allocate the scarce goods by distributing only to preferred customers. However, rationing goods might be considered as inequitable (unfair) – because it is likely that eventually those who might have the greatest need for a commodity are unlikely to have their needs met.

The quality of products, in the long run, might worsen as producers are tempted to use cheaper factors or cut corners.

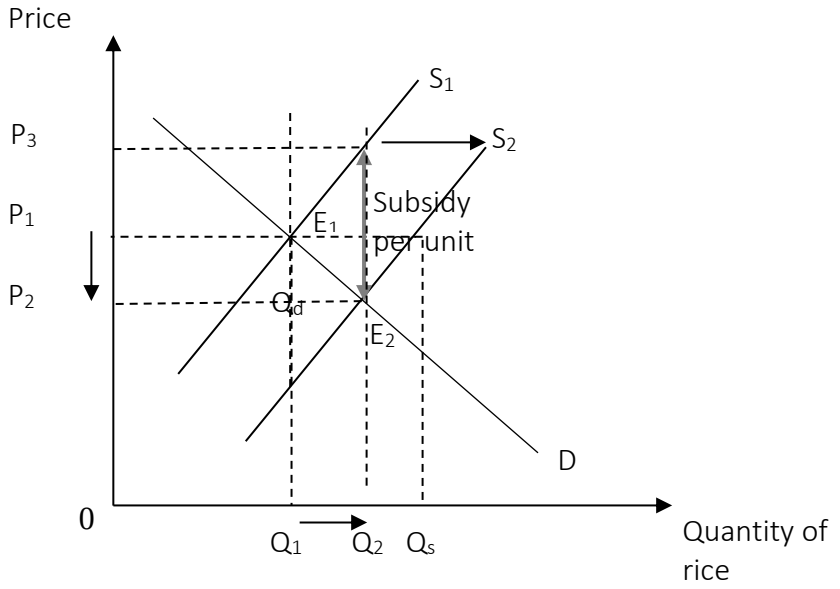
Therefore, other measures should be considered:

(i) Subsidies

This is a form of financial assistance made by the government to assist production so as to keep rice prices low for consumers. The increase in the subsidy on the production of a good or service will have an effect similar to a reduction in the cost of production, increasing profitability and thus increasing the supply, ceteris paribus.

When a subsidy is given to a producer of a good, it decreases the cost of production. This is because the producer receives monetary payments or grants for every unit of the good sold. This results in an increase in supply due to an increase in the willingness and ability of a producer to sell a good, as illustrated by a rightward shift in the supply curve from S_1 to S_2.

The subsidy per unit is indicated by the vertical distance between the supply curves (P_2P_3), which shows the "change" in the cost of production.



The increase in supply will result in a surplus of Q_dQ_s at the original equilibrium price of P_1. Refer to section 4 for a detailed explanation of the price adjustment process. Thus the effects of a subsidy on the production rice are a decrease in equilibrium price from P_1 to P_2 and an increase in equilibrium quantity from Q_1 to Q_2.

However, a subsidy usually takes a toll on the government budget, and the share of subsidy that goes to consumers depends largely on the relative price elasticity of demand and supply of rice.
Also, over-subsidising may result in over-reliance on the government that affects the motivation of the lower income groups in seeking better employment opportunities.

(ii) Stockpiling of imported rice

The Singapore government should continue to stockpile imported rice as a buffer against short-term rice shortages:

- Singapore currently stockpiles a three-month supply of rice by requiring rice importers to import a minimum of 50 tonnes every month and to maintain two months' worth of imports in government warehouses for up to a year.
- This policy ensures that there can be an increase in the supply of rice in the market during times of short-term rice shortages, thus effectively stabilising domestic rice prices until the stockpiled rice supply runs out.
- **However, stockpiling of rice is subjected to the availability of land required for the building of warehouses, trade policies of rice-exporting countries (e.g. they may impose an export ban), and excessive stockpiling can lead to losses from spoilage.** For instance, if there is a global shortage of rice due to poor weather conditions, rice-exporting countries may limit rice exports to ensure self-sufficiency, hence reducing the amount available for Singapore to import for consumption and stock-piling purposes.
- **In addition, there is a concern that the stockpiled rice may eventually run low, causing rice shortages to return. In view of this, stockpiling is at best a short-term measure.**
- **More importantly, stockpiling does not address Singapore's continued exposure to fluctuations in global rice prices due to a lack of self-sustainability.**

(iii) Expanding domestic rice supply sources

As a long-term approach, Singapore should explore domestic production of rice to enhance the country's ability at mitigating changes in global rice prices.

- **In view of the vulnerabilities caused by Singapore's reliance on rice imports, it is important for the government to look into how Research & Development (R&D) can be used to develop domestic rice varieties.**
- Encouragement of R&D can be done via the government giving **subsidies** to absorb part of the high R&D costs incurred or by promoting **public-private partnerships** among local agricultural firms.
- In 2018, scientists at the Temasek Life Sciences Laboratory have successfully developed Temasek Rice, an organic and whole grain rice variety that can help contribute to longer-term food security in Singapore, after 8 long years of R&D work.
- **However, not only is a long time period required for R&D to take effect, substantial financial resources are also needed by the government to subsidise these R&D efforts.** Faced with the need to support economic restructuring and a rapidly ageing population, the Singapore government may not have sufficient tax revenue to channel into the R&D of domestic rice varieties.

<u>Synthesis/ Conclusion</u>

- In conclusion, there are several policies that the Singapore government can undertake to stabilise domestic rice prices. However, not all policies are equally feasible and effective.
- As it is not feasible to reduce the domestic demand for rice given that it is a necessity, implementing supply-side policies is necessary and should be urgently looked into to ensure that the country can address rice shortages when they happen.

- With poor weather conditions expected to worsen in the future, the vulnerabilities faced by farmers in rice-exporting countries suggest that continuous dependence on imported rice will only expose Singapore to greater price fluctuations in the future.
- Thus, R&D should be poured into the creation of rice varieties that can withstand extremely dry and weather for extended periods of time. R&D can also help to increase crop yield and enhance resistance against diseases.
- Although Singapore does not have favourable rice-growing conditions domestically, technological advances in the agricultural field can help local agricultural firms to grow crops using methods such as vertical farming, therefore successfully overcoming the geographical constraints faced.
- All in all, the Singapore government should prioritize supply-side policies, continue to adopt a modest and gradual appreciation of the SGD alongside stockpiling of imported rice.

Level	**Knowledge, Application/Understanding/Analysis**	**Marks**
L3	• Good explanation of price caps and how it helps to sold the problem on rising rice prices, with good analysis on its possible limitations and disadvantages. • Good discussion on at least 2 other policies that is conceptually sound and developed, with consideration of the limitations and constraints faced by the Singapore government in adopting the various policies • Well-substantiated by examples that are contextualized to Singapore	8-10
L2	• Underdeveloped explanation of price ceiling and how it helps to sold the problem on rising rice prices, with good analysis on its possible limitations and disadvantages. • Some knowledge of other policies that the Singapore government can adopt to stabilise domestic rice prices but may not be sufficiently developed in terms of economic reasoning • Some attempts to use the context given	5-7
L1	• Mere listing of points with limited use of Economic concepts • Answer may contain conceptual errors • Limited use of the context given	1-4

Evaluation		
Level	*Descriptors*	*Marks*
E3	• Sound use of valid evaluation criteria in examining the policies that the Singapore government can adopt • Providing a considered overall judgement	4 – 5
E2	• Some attempts in examining the policies that the Singapore government can adopt, with attempts of using valid evaluation criteria but may lack clarity • May not provide a considered overall judgement	2 – 3
E1	• Simple evaluative statements are made, but they remain largely unsubstantiated	1

Essay Question 5
(Source: 2020 SAJC JC1 H2 FE)

Annual spending by the Singapore government on the preschool education sector is set to double to more than $2 billion per year within the next few years. Parents will pay less for preschool as subsidy amounts increase across all eligible income tiers. Through education, the Singapore government believes that it can help its citizens to gain skills, learn knowledge and become productive.

Source: The Straits Times, 18 February 2020

(a) Explain why a free market would fail to operate efficiently in the market for education. **[10]**

(b) Evaluate the policies currently used by the Singapore government to correct the market failure in the market for education. **[15]**

Part (a)

Command Word	Explain
Content	Free market fail to operate efficiently
Context	Education

Market Failure	
Positive Externalities in consumption	Imperfect Information

Introduction

The free market uses the price mechanism, which is the interaction of demand and supply, to achieve efficient allocation of resources. Under perfect conditions, the price mechanism is able to allocate resources efficiently. However, there are times when it can fail to achieve the objective of allocative efficiency due to the presence of sources of market failures.

Allocative efficiency is achieved when resources are allocated in a manner to produce the combination of goods and services most wanted by society.

Market failure refers to the situation in which markets produce undesirable outcomes in the form of inefficient allocation of resources. This occurs when the free markets does not provide the right mix of goods and services or the optimal amount of goods and services most wanted by society. As a result, societal welfare is not maximized.

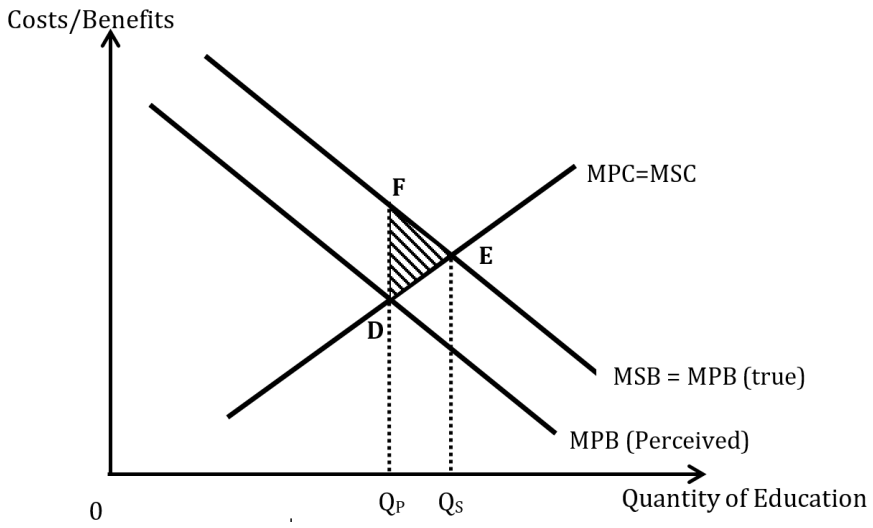
Body

Education is deemed as a merit good and the two sources of market failure associated with it is imperfect information as well as the presence of positive externalities in consumption.

Merit Goods are goods and services deemed to be socially desirable by the government and which the government feels that people will under-consume if left to the free market because of consumers' failure to recognize the full benefits that could be derived from the consumption of the good as well as the presence of positive externalities in consumption.

When left to the free market, consumers may under-estimate the marginal private benefits (MPB) generated by the consumption of education due to the ignorance about its potential benefits in the long-term such as better job prospects as well as higher potential income.

As a result, the perceived MPB is lower than where true MPB is as shown in the diagram below.



If there is no government intervention in the consumption of education, consumers who seek to maximise their utility, will consume at $0Q_P$ (where MPB(perceived) =MPC) rather than at $0Q_S$ where MSB= MSC, which is the allocative efficient quantity as this is the level where societal welfare is maximised.

The quantity under-consumed, Q_PQ_S, would have generated a social benefit of Q_PFEQ_S which exceeds its social cost of Q_PDEQ_S.

Thus consuming $0Q_P$ instead of $0Q_S$ results in a deadweight loss of area DEF for the society.

Thus there is a need for government intervention to encourage the consumption of education by correcting the information failure as the free market is not able to allocate resources efficiently.

Additionally, when left to the free market, society will under-consume merit goods due to the presence of external benefits.

The marginal social benefits derived from consuming merit goods exceed the marginal private benefits at every quantity due to the presence of positive externality.

The private benefit of consuming education would be the knowledge derived while the private cost of consuming education would be the schools fees and cost of books incurred.

However, in the consumption of education, there are positive externalities generated due to it. The benefits of education are not just confined to the individuals who consume education. The external benefits of education include active volunteerism, citizenry as well as creation of employment for third parties by the educated as these individuals who consume education would drive innovations as well as setting up of social and commercial enterprises.

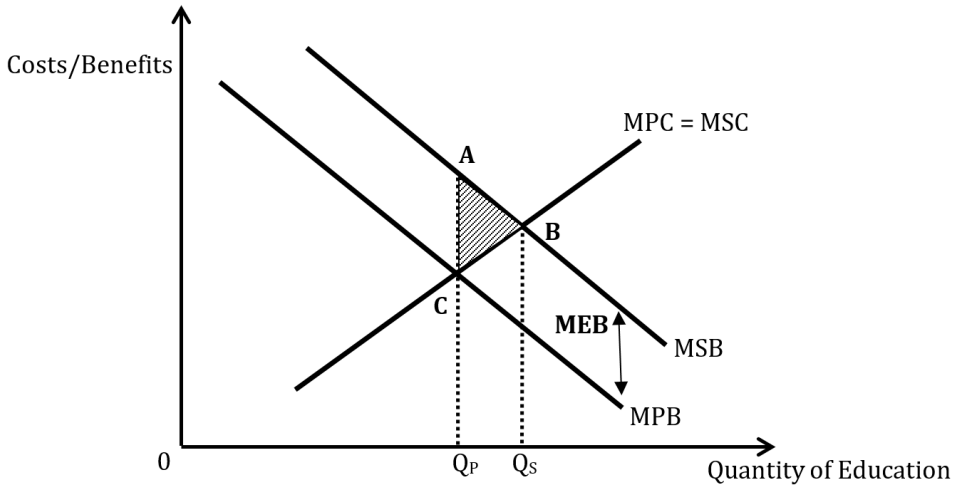


Fig: Positive Externalities in consumption

As a result, the MSB is higher than where MPB is, as shown in the diagram above due to the presence of MEB, which causes the divergence.

If there is no government intervention in the consumption of education, consumers who seek to maximise their utility, will consume at $0Q_P$ (where MPB =MPC) rather than at $0Q_S$ where MSB= MSC, which is the allocative efficient quantity as this is the level where societal welfare is maximised.

The quantity under-consumed, Q_PQ_S, would have generated a social benefit of Q_PABQ_S which exceeds its social cost of Q_PCBQ_S.

Thus consuming $0Q_P$ instead of $0Q_S$ results in a deadweight loss of area ABC for the society.

Thus, there is a need for government intervention to encourage the consumption of education by addressing the positive externalities in consumption as the free market is not able to allocate resources efficiently.

	Knowledge, Understanding, Application, Analysis
L3 **8 - 10**	Clear and developed explanation of the reasons why the free market would fail to operate efficiently in the context of education. Well-developed answered that addresses the two possible sources of market failure in the market of education.
L2 **5 – 7**	Under-developed explanation of the reasons why the free market would fail to operate efficiently in the context of education. Answer may only have addressed one possible source of market failure (either positive externalities in consumption or imperfect information).
L1 **1 – 4**	For an answer that may show some knowledge of the reasons why the free market would fail to operate efficiently in the context of education. Answer illustrates that the meaning of the question had not been properly grasped and there are some errors or misconceptions.

Part (b)

Command Word	Evaluate
Content	Policies currently used
Context	Market for education SG government

Market for Education			
Market Failure			
Positive Externalities in consumption		Imperfect Information	
Policies			
Subsidies	Direct Provision	Legislation	Public Education

<u>Introduction</u>

As identified in part (a) – the two sources of market failure associated with education are imperfect information as well as positive externalities in consumption.

To correct the market failure in the market for education, the Singapore government has used a combination of policies which include the use of subsidies, direct provision, legislation as well as public education.

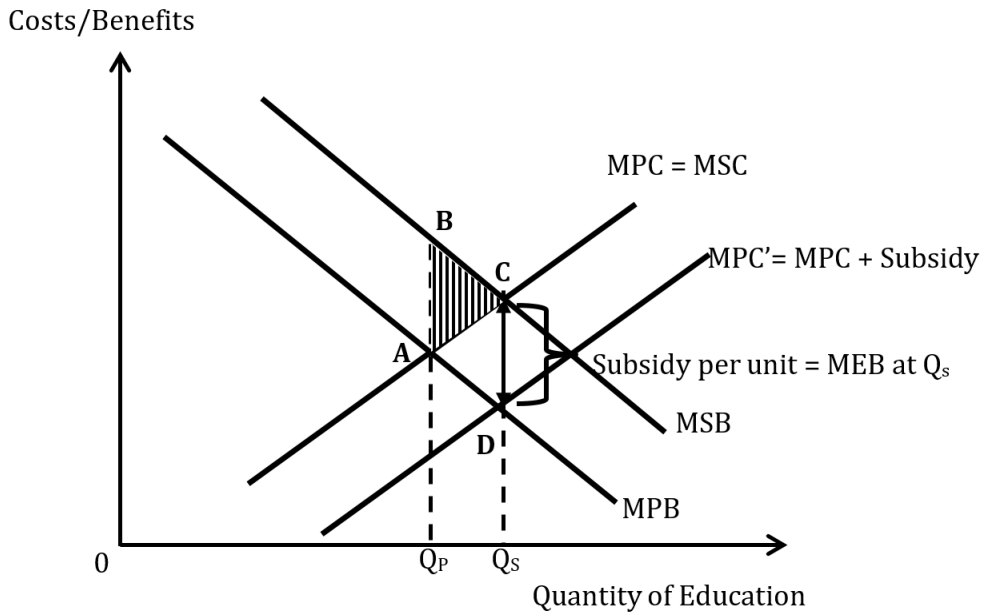
Body

Subsidies

As mentioned in the preamble, subsidies have been given in order to encourage consumption of education. We will look at the case in which subsidies are given directly to producers.

To correct the under-consumption, the government may provide a per unit subsidy equivalent to MEB at OQs to the producers- the education institutions.

When subsidies are provided to education institutions, this lowers the cost of production. Assuming these education institutions pass on these cost savings to consumers in the form of lower prices, this would lead to the MPC of consumers to decrease from MPC to MPC'.



When left to the free market, consumers would now seek to maximise their utility and consume at the level OQs, where MPC' = MPB and this is the societal optimum level of consumption as this is the same point where MSC=MSB where societal welfare is maximised.

Through the subsidy, it would increase the level of consumption from OQp to OQs as the external benefit is now internalized, and thus

	helpful in eliminating the deadweight loss area ABC. In addition, the subsidy provided is helpful to improve equity concerns as low income households who previously faced issues affording education may now be able to access education. Although such a measure can help to achieve the allocative efficient level of output, it is difficult to estimate the amount of subsidy to be provided as it is difficult to accurately measure the marginal external benefits. Firstly, it might be difficult to even identify who these third parties are. Secondly, it is almost impractical to impute a monetary value to such benefits for the purpose of computing the correct amount of subsidies to be given. In addition, consumers and producers might over-consume and over-produce the goods or services respectively if they were heavily subsidised. Consequently, over-consumption/over-production may occur and result in an over-allocation of scarce resources to the market in which the government intervened– a failed attempt to achieve allocative efficiency. In addition, there is always an opportunity cost to the provision of subsidies. Subsidies may also take a toll on the government budget as the subsidy given to consumers or producers could be channelled to other uses, e.g. the development of infrastructure. **<u>Direct Provision</u>** Besides policies such as subsidies, the Singapore government has also directly provide education. The Singapore government, through the Ministry of Education, is the principal provider of education at primary, secondary and tertiary levels. Through direct provision, it can increase consumption of education to the socially optimum level of OQs. Direct provision of education helps to ensure that there is adequate supply of schools to meet the needs of the population as well as ensuring that the quality of education provided is at a level that is deemed acceptable by the Ministry of Education. However, the limitations of direct provision is that it would incur high cost as government provision requires high level of financing which would take a toll on government's budget and creates opportunity cost. In addition, while public provision will enable the government to directly provide the optimal amount of the good, it may also result in inefficiency as the government may be subject to government failures as well. This happens when the government, in its bid to intervene and correct the situation in the markets, ends up making the situation worse by creating greater inefficiency.	

Legislation

The government has also formulated rules and legislation to bring the consumption of goods with positive externalities up to the socially optimal level.

For example, recognising the external benefits of education as an enabler in skills acquisition, the Compulsory Education Act in Singapore came into effect on 1st Jan 2003. It enforces compulsory education for all Singaporeans up to Primary 6. This is targeted at bringing the consumption of education up till Primary 6 to the socially optimum level for the general population in Singapore.

Although legislation is a direct policy and fast to implement, however, there are concerns in terms of the high administration cost involved to ensure compliance.

Rules and legislation take time to be formulated. To strike a balance between being overly-restrictive and being lax in their enforcement requires substantial amount of research and deliberation by government officials. In addition, as the circumstances change, such rules and regulations need to be reviewed regularly, thus incurring even higher costs in the years ahead.

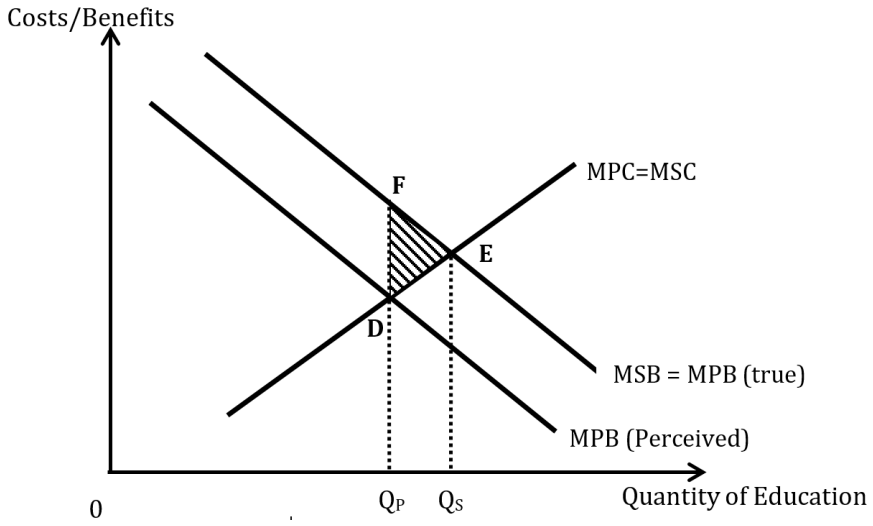
Public Education

As mentioned in part (a), one of the source of market failure is imperfect information.

Therefore, to address the under-consumption of education due to the under-estimation of the private benefits involved in the consumption of education, the Singapore government has also engaged in public education to reinforce the importance of education and the potential benefits that education can bring about.

One of the reasons why education is under-consumed is due to information failure, where parents, especially those with low social economic status, are unaware of the true benefits of education. For these parents, even if school fees were not an issue (since fees could already be highly subsidized), they may not be fully aware of the full private benefits of education and their immediate concern would be to have their children work to help support the family instead.

Therefore, to close the information gap, the Singapore government attempts to provide support by creating platforms, deploying counsellors and social workers to help them understand the true private benefits of education, so as to encourage them to keep their children to school longer. This will increase MPB (perceived) to MPB (true).



Synthesis

In conclusion, current policies adopted by the Singapore government to deal with education are largely sufficient as there is a wide range of policies to deal with the two sources of market failure – namely positive externalities in consumption and imperfect information.

Nevertheless, as Singapore experiences changing demographics, the effectiveness of policies may differ as time passes. The Singapore government thus, should continue to monitor and adjust their policies to ensure that they remain appropriate and effective in targeting the right groups of people and addressing the root causes of the problem.

Changing Demographics

E.g. with lower birth rates, what would be the optimal extent of provision of schools be? What would be the optimal student-teacher ratio be like? Would it necessitate the closing of more schools?

E.g. with rising concerns of equity concerns, would it mean more subsidies need to be provided?

E.g. Amount of subsidies to be given considering the different level of positive externalities associated with the different level of education (primary vs secondary vs tertiary).

	Knowledge, Understanding, Application, Analysis
L3 **8 - 10**	Clear and rigorous assessment of the policies used by the Singapore government in the market for education. Answer addresses both sources of market failure associated with education. Well-developed answered that discusses at least 2 different types of policies.

L2 **5 – 7**	Under-developed explanation of the policies used by the Singapore government in the market for education. Answer may only have addressed one possible source of market failure (either positive externalities in consumption or imperfect information). Answer that discusses at least 2 different types of policies. However, explanation and elaboration is under-developed.
L1 **1 – 4**	For an answer that may show some knowledge of the policies used by the Singapore government in the market for education. Answer illustrates that the meaning of the question had not been properly grasped and there are some errors or misconceptions.

E3 **4- 5**	A well-reasoned judgement substantiated with economic analysis. Synthesises economic arguments to arrive at well-reasoned judgements and decisions such as in a good summative conclusion
E2 **2-3**	Some attempt at evaluation or summative conclusion. Relevant to question but does not explain the judgement or base it on relevant analysis.
E1 **1**	For an unexplained statement or conclusion.

Essay Question 6
(Source: 2020 SAJC JC1 H2 FE)

The shift in consumers' habits have led to consumers switching from buying groceries from physical stores to shopping via online grocery retail platforms like Redmart. NTUC Fair Price and Dairy Farm Group Singapore (which owns Giant and Cold Storage supermarkets) still dominate the grocery retail industry but their market shares have been affected by new entrants like Hao Mart and other online retailers.

(a) With the use of examples, distinguish the features of oligopolistic and monopolistic markets. **[10]**

(b) In light of the market structure that grocery retail stores operate in, discuss the impact of greater competition on consumers and different types of economic efficiency. **[15]**

Part (a)
Question Analysis:

Command:	Distinguish i.e. explain the difference With the use of examples, i.e. use your own relevant, authentic examples
Content:	Oligopolistic and monopolistic market structures Features i.e. level of barriers to entry; number of firms and market share; nature of products; mutual interdependence
Context:	None specified i.e. choose your own examples

Schematic Plan:

Features	Oligopoly	Monopoly
Barriers to entry	High	Very high
No. firms/ Market share	Few large firms, each with sizeable market share May/may not have a few small firms too	Single seller Firm's SS = Market SS
Nature of products	Either homogenous or differentiated	Unique
Type of competition	Mutual independence: firms need to consider rivals' reactions in making pricing decisions	Independent in making pricing and output decisions
Demand curve	Downward sloping PED>1 since (close) substitutes available Kinked Demand curve given the rigidity of prices	Downward sloping PED<1 given lack of substitutes
E.g.	○ Pharmaceutical industry ○ Petrol retailing ○ Supermarkets ○ Telecommunication companies ○ Taxi companies ○ Rail operators (prices advised by PTC) ○ Public bus service operators (prices advised by Public Transport Council) ○ Waste management	○ De Beers diamonds ○ Water treatment ○ Microsoft Operating system

Suggested answer:

An oligopoly occurs when there are only a few dominant firms in the industry, each with a sizeable share of the market and accounting for a significant proportion of the industry's output. A monopoly refers to a single supplier of a product or service for which there are no close substitutes. Being the only seller, the firm is also the industry. This essay will consider various features of markets, including the level of barriers to entry; number of firms and market share; nature of products; and the nature of competition.

Barriers to entry (BTE) are factors which prevent or deter the entry of new firms into an industry and thereby limit the degree of competition faced by existing firms. Protected by multiple patents and licenses which constitute very high legal BTE, Microsoft is the monopoly seller of its unique MS Operating System for computers. New firms are unable to enter the industry even when Microsoft was reaping supernormal profits, because BTE are high enough to prevent that. Thus, Microsoft can maintain its monopoly position and retain its supernormal profits in the long run.

The level of BTE in an oligopolistic industry is also high though it tends not to be as high as that in a monopoly market. For instance, the petrol retailing industry has very high cost BTE as heavy infrastructural investment is necessary at the onset and firms need to operate at a sufficiently large scale to reap economies of scale. This industry typically consists of a few large firms and the firms are usually directly affiliated to the refineries. In Singapore, the industry is dominated by the four firms – Chevron, ExxonMobil, Shell and SPC.

Being the sole seller, a monopolist controls 100% of the market share for the unique good it sells. In contrast, in an oligopolistic industry such as the petrol retailing industry, each retailer possess significant amount of market share.

A monopolist sells a unique good or service which is not available from other firms. Hence, demand for the good is very price inelastic given the lack of close substitutes. Firms in an oligopolistic market, on the other hand, could sell either a homogenous or differentiated product. For instance, petrol is largely considered a homogenous commodity. Although petrol companies use additives to differentiate their products, consumers still demonstrate high sensitivity to price changes indicating that petrol sold by different retailers are largely considered perfect substitutes. With the availability of substitutes, demand tends to be relatively price elastic.

A monopolist is largely independent in making pricing and output decisions. Microsoft can and would, to a big extent, independently price the licence fees for their Operating Systems since no other firm offers a (close) substitute. That said, with advancements in technology and developments in software engineering, this remains a contestable market and Microsoft may choose to price its goods competitively. It would also commit sizeable amount of resources to research and development to continually refresh its products.

In contrast, oligopolistic firms are mutually interdependent and would carefully consider rivals' reactions as they determine their price and output level. Especially in a market where the good sold is homogenous, such as petrol, prices tend to be rigid. Any price hike will not be matched by rivals thus the firm might suffer a big fall in quantity demanded and profits. Any price reduction will be matched by rivals as all firms aim to avoid losing consumers. Consequently, firms tend to avoid price competition. Instead, firms pursue various non-pricing strategies to boost demand. Petrol retailers have various loyalty schemes to reward consumers for their repeated patronage. For example, Esso awards 'Smiles Points' for the purchase of their 'Syngergy' fuel which are redeemable for fuel, convenience store items, etc. To differentiate themselves from other retailers and to attract consumers by providing convenience, all Esso

petrol stations feature convenience stores that are managed in co-operation with NTUC FairPrice, either under the ‘Cheers’ or ‘FairPrice Xpress’ brand.

Hence, oligopolistic and monopolistic markets mainly differ on the level of barriers to entry and how the firms compete.

	Knowledge, Application/Understanding and Analysis	
L3	For a well-developed explanation of differences in characteristics of a monopoly and an oligopoly. Examples provided give a distinct difference between the two market structures.	8-10
L2	For an under-developed explanation of differences in characteristics of a monopoly and an oligopoly. Responses contain some relevant examples.	5-7
L1	For an undeveloped explanation of differences in characteristics of a monopoly and an oligopoly. Responses may tend to be largely theoretical, contain conceptual errors or lack the use of authentic and appropriate examples.	1-4

Part (b)
Question Analysis:

Command:	Discuss i.e. balanced analysis with different perspectives
Content:	○ Market structure, key features of an oligopolistic market ○ How firms compete i.e. pricing and non-pricing strategies ○ Criteria for assessing consumer welfare, e.g. price; choice; quality; variety; consumer surplus ○ Types of economic efficiency i.e. allocative efficiency; productive efficiency; dynamic efficiency
Context:	Grocery retail industry in Singapore, which has an oligopolistic market structure

Schematic Plan:

Intro
- Identify the market structure that grocery retail stores in Singapore operate in
- Explain the key features of the industry
- Explain what 'greater competition' entails
- List the criteria for assessing consumer welfare
- List the types of economic efficiency

Body
Retailers will compete using a range of pricing and non-pricing strategies.
Retailers may, in response to ↑competition, undertake a higher degree of:
- Product innovation (↑range of products, develop online shopping platforms, etc.)
- Process innovation (↓average COP)

	Positive impact	Negative impact
Consumers	○ If pricing strategy is used e.g. offering discounts on selected goods → ↓price ○ ↑Choices of retailers and ↑avenues for grocery shopping, to better cater to tastes and preferences ○ Non-pricing strategy e.g. product differentiation → retailers expand the range of products offered; improve upon customer service; better quality produce → ↑quality	○ ↑Expenditure on advertising may not bring tangible benefit ○ With ↓π, may limit ability to undertake R&D for product development ○ ↑Competition → limit incumbent's ability to expand scale of production → limit ability to reap iEOS → lower producer's ability to ↓P
AE **PE** **DE**	○ If↓P → may ↓allocative inefficiency ○ If ↓AC → can ↑PE ○ Product and process innovation → can ↑DE	○ ↑Competition → limit incumbent's ability to expand scale of production → limit ability to reap iEOS → lower the extent of benefit to PE ○ ↓π → limited ability to undertake process innovation → lower the extent of benefit to DE

Conclusion/Evaluation
Judgement: overall, impact is likely to be positive/negative
Factors which determine extent of impact include:
- [time: LR] Retailers' ability to sustain R&D efforts
- [context] Whether retailers choose to compete on price
- [time: LR] Number of retailers that remain in the industry in the LR

Suggested answer:

Introduction

The grocery retail industry in Singapore operates as an oligopolistic market, given that there are a few large and dominant firms with multiple small firms. Barriers to entry are high in this industry and this results in the presence of a few large firms that can earn and maintain supernormal profits. Being a competitive oligopoly, the retailers compete using mainly non-pricing strategies although pricing strategies are also used at times.

Greater competition is brought about by the entry of new firms into the grocery retail industry and this would influence the behaviour of the incumbents, like NTUC Fair Price and Cold Storage. The resultant impact on consumers can be assessed by the impact on prices consumers pay for groceries; the choices they have in terms of retailers they can patronise; the quality and variety of grocery items available for sale and the customer service standards; and consumer surplus. The main types of economic efficiency include allocative efficiency (AE); productive efficiency (PE); and dynamic efficiency (DE). The degree of efficiency would also be determined by firms' behaviour. The essay will consider both the possible positive and possible negative impact on consumers and efficiencies, arising from greater competition.

Body

The entry of new firms into the grocery retail industry raised the level of competition. This directly benefits consumers as they now have more choices of retailers and more avenues for grocery shopping (shopping in physical stores, online or via smartphone applications). This better caters to the diverse needs and preferences of different consumers.

Incumbents will seek to maintain their market share and profit level, and perhaps even drive new (or smaller) rivals out of the market. New entrants will seek to expand their market share and become profitable.

On one hand, the ways in which retailers respond to greater competition can positively impact consumers and the different types of economic efficiency.

This being an oligopolistic industry, retailers may use pricing strategies but are likely to avoid entering a price war. Retailers are likely to offer more time-bound discounts on some popular grocery items, to attract consumers. Such discounts are routinely advertised in mainstream media outlets, such as via full-page advertisements in local newspapers, and many intensify in the face of greater competition. Hence, consumers can benefit from paying lower prices and consumer surplus may increase. This could also reduce the extent of allocative inefficiency, if the gap between price and marginal cost is reduced.

Retailers will use a range of non-pricing strategies to retain or expand their demand and market share. Retailers can conduct market research and refresh/update the range of items they offer. For instance, with the nation-wide campaign to battle diabetes, more consumers may be keen to consume less-sugar options for snacks and drinks. Retailers can increase the range of such goods offered. Customer service standards can be enhanced by adding information counters in physical stores or virtual shopping assistants on digital platforms. With rising affluence, retailers can offer more premium items such as organic produce or premium produce from regions known for their very high quality agricultural produce, such as Japan. Eccellente by Hao Mart is a chain of stores that boasts a range of international products, probably targeted at more well-heeled consumers. Such strategies will enable consumers to benefit from higher quality products as well as shopping experience.

As the winds of change in consumers' habits and lifestyle are most probably here to stay, incumbents may undertake process innovation and modify the nature of their operations by developing online shopping platforms to complement their existing physical stores. NTUC Fair Price had also joined the online grocery shopping arena by developing a web based shopping platform that offers free delivery with a minimum spending. Firms are likely to try to enhance their digital platforms to offer consumers more seamless and convenient shopping experiences. Such efforts enhance dynamic efficiency while benefiting consumers with better quality of shopping experiences.

In the face of lower demand (and hence revenue), retailers may attempt to reduce costs in order to maintain their profit levels. For instance, retails may try to find alternative sources of suppliers for grocery items which can offer a lower price. Or, they may introduce more automation in their warehouses to increase the level of efficiency in managing inventory stock. If successful, such efforts can lower retailers' average cost and hence enhance productive efficiency.

On the other hand, **greater competition might not have a positive impact consumers and the different types of economic efficiency**.

Retailers are likely to increase expenditure on advertising to stand out amongst the competition so as to get consumers' patronage. Such expenditure may not bring tangible benefit to consumers and could have diverted firms' precious resources away from other areas like staff training which could have a positive impact on consumers' shopping experience.

Assuming that greater competition reduces an incumbent's profits, this may limit retailers' ability to undertake research and development for process innovation. This could negatively impact the level of dynamic efficiency. Greater competition will stifle the demand of firms (the incumbents may face a fall in demand while new retailers will take much time to grow their demand) and limit retailers' ability to expand their scale of production. This will limit their ability to reap internal economies of scale, thereby lowering retailers' ability to reduce their average cost of production and their prices of goods. This can limit the gains in productive efficiency.

Conclusion

In conclusion, greater competition should have a positive impact consumers and the different types of economic efficiency overall. A few factors will determine the extent of the impact. First, although greater competition provides strong incentive to undertake R&D, retailers' ability to sustain R&D efforts even in the long run can impact the extent of improvement to productive and dynamic efficiency, and to the quality of consumers' experience.

Next, how the retailers choose to compete will influence whether and how consumers benefit. For instance, on the pricing front, if retailers choose to follow a price leader (which could be NTUC Fair Price since it possesses huge market share and is a very established household name) and avoid competing on price, then consumers would not benefit from price reductions. Notwithstanding, retailers will compete using various non-price strategies hence on balance, consumers will stand to benefit.

Furthermore, not all retailers may be very profitable and there could well be adjustments to the number of retailers in the industry in the long run. For instance, retailers who are unable to garner or maintain enough revenue to cover costs in the long run will opt to leave the industry. The number of retailers that eventually remain in the industry will determine the competitive behaviour of firms, which then impacts on consumers' welfare and the types of economic efficiency.

	Knowledge, Application/Understanding and Analysis	
L3	• For an answer that presents a thorough knowledge of facts and theory. Balanced analysis for both the positive (i.e. thesis) and negative impacts (anti-thesis) of greater competition on consumers (price, choice, quality, variety, etc.) and on AE, PE, DE. • Consistent and good use of examples and application to the context of grocery retail industry.	8-10
L2	• For an accurate but undeveloped analysis. Undeveloped links between firms' behavior in light of greater competition and consumers' welfare and the types of economic efficiency. • Weak/ inconsistent use of examples, in the context of grocery retail industry.	5-7
L1	• For an answer that is mostly irrelevant and/or contains only a few valid points. Merely listing of criteria for assessing consumers' welfare and the types of economic efficiency. • Limited/ no application to greater competition in the industry and its effects on consumers and different types of economic efficiency. • No application to the context of the grocery retail industry. • One-sided, incomplete analysis.	1-4
E3	For well-reasoned and supported judgements of the factors determining the nature and extent of impact of greater competition on consumers' welfare and various types of economic efficiencies.	4-5
E2	For an unsubstantiated/ unexplained judgement.	2-3
E1	For an unexplained conclusion or evaluative comment.	1

Essay Question 7
(Source: 2021 SAJC JC1 H2 FE)

1	By 2060, Singapore's total demand for water could double. Worsening climate conditions such as droughts further dwindle Singapore's limited water resources. Singaporeans might face severe water shortage. A sharp increase in the future price of water is inevitable.	
(a)	Explain why Singapore may experience a severe water shortage and why the price of water may increase sharply in the future.	**[10]**
(b)	Using the theory of demand and supply, assess the strategies that Singapore's households and government could adopt in response to severe water shortage.	**[15]**

Question Analysis

Command	Explain
Content	Shortage (Qdd > Qss) Price Mechanism PED/ PES
Context	Water

Schematic plan

Intro: Define shortage, PED, PES and importance of price mechanism	
Explain shortage	Explain why price increase sharply
• Identify demand and supply factors • Determine if Qdd > Qss at the old equilibrium price	• Both demand and supply factor reinforced the price increase • More importantly, PED <1 and PES<1 of water • Price mechanism process

(a)

Introduction

Severe water shortage and subsequent sharp increase in water price can be explained by 1) the large magnitude of change in the demand and supply of water, as well as 2) both the PED and PES of water respectively.

Body

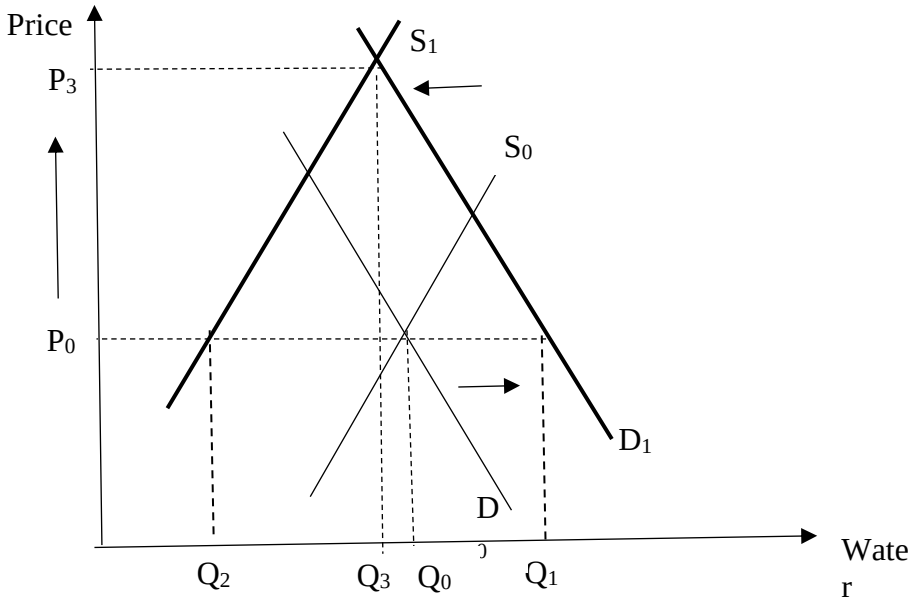
Severe water shortage is due to large magnitude of change in the demand and supply of water.

Water Supply decreases:

The supply of water refers to the various quantities of water producers are willing and able to offer for sale at various prices over a period of time, ceteris paribus. Given worsening climate conditions such as droughts that further dwindle Singapore's limited water resources, water supply will decrease further.

Water demand increases:
Demand for water represents the various quantities of water that consumers are willing and able to buy at various prices over a given period of time, ceteris paribus. It is expected that water demand will double in 2060.

Illustrate and explain with a DD-SS diagram.



With reference to Figure 1, supply decreases significantly from S_0 to S_1. Whereas demand rises significantly from D_0 to D_1.

At the original price, we now have the quantity demanded greater than quantity supplied, Q2 > Q1, leading to a shortage of water, denoted by Q2Q1 in the horizontal axis.

Sharp increase in price of water is due to the fact that demand and supply of water are both price inelastic

This shortage will lead to an increase in the price of the water. More importantly, the price increases sharply is due to demand and supply of water are both price inelastic (i.e. PED <1; PES <1)

The demand for water is likely price inelastic, since there are no substitutes for water, and is also a necessity for survival. This means that the quantity demanded of water will change less than proportionately to a change in price. The supply for water is price inelastic, as water reserves (i.e. akin to availability of inventory) are depleting. This means that the quantity supplied of water will change less than proportionately to a change in price.

At Po, there is an upward pressure on water price. As demand for water is price inelastic, consumers will reduce quantity demanded of water less than proportionately. On the other hand as supply of water is price inelastic, the quantity supplied on water

will increase less than proportionately. In order to clear the shortage ($Q_1 – Q_2$) at the original equilibrium price, a large rise in price is required due to the less than proportionate changes in quantity demanded and quantity supplied.

Conclusion
Eventually, the price of water increase from Po to a much higher price of P3. The equilibrium quantity Q3, where Qs will once again be equal to Qd.

Levels	Knowledge, Understanding, Application, Analysis	Marks
L3	For a well-developed explanation on how shortage of water resulted given the changes in the demand and supply factors; and how water price may increase sharply using PED and PES concepts as well as relevant examples. Price adjustment process is well explained and well-illustrated with demand-supply analysis.	**8-10**
L2	For an explanation on how shortage of water resulted given the changes in the demand and supply factors; and how water price may increase sharply using PED and PES concepts as well as relevant examples. Price adjustment process is explained and illustrated with demand-supply analysis. However, responses contain some application to the given context and demonstrate use of demand-supply analysis with some errors.	**5-7**
L1	Responses tend to lack theoretical analysis, contain conceptual errors or lack the use of demand-supply analysis.	**1-4**

Markers' Comments

- This part of the question is identical to the timed trial question that your tutor would have gone through with you during the revision period.
- While the requirement is a very straightforward one which required students to just explain the price adjustment process, we see a vast disparity in terms of the quality and accuracy of the responses.
- Students, who studied and understood the price mechanism well, tend to get near to full credit.
- There were also many students who clearly did not understand the process but still chose to do the question, possibly because they were also not confident in answering the other questions.
    - Price mechanism is a fundamental and basic concept. It is very important for all students to clarify their understanding.

(b)

Question analysis

Command:	Assess

Content:	- Reduce/ alleviate shortage
	- Demand and supply factors
	  o Reduce demand of water
	  o Increase supply of water

Context:	Water

Schematic Plan

Intro Outline the various strategies to reduce/alleviate shortage is to reduce demand and increase supply of water	
Body	
Strategies to increase supply	Strategies to reduce demand
• Government strategies • Evaluation	• Government strategies and household responses • Evaluation
Conclusion Overall stand regarding which strategy is most effective, given the context	

Intro

Water shortage is created at the original price of water even as demand and supply change. Government may keep the price of water at the original price via price controls (e.g. price ceiling) so as to keep the price of water affordable.

However, to alleviate the consequence of a water shortage due to the price control, efforts such as increasing water supply but more importantly reducing demand for water can be adopted by both households and government.

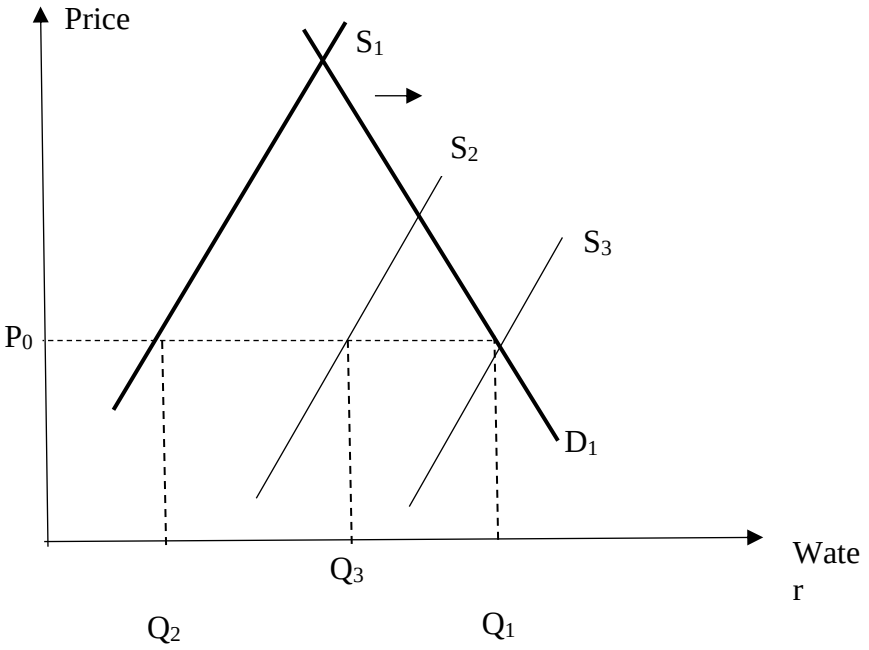
There are a few possible strategies. Government can increase water supply by adopting more advance and productive technology to produce more drinkable water e.g. desalination and NEWater. Government can also implement regulations to reduce the overall demand for water by reducing wastage and educational campaigns for households.

Body

Government can increase the supply of water

Essentially, government can increase water supply given the shortage. With reference to the diagram, successful strategies to increase water supply will shift the supply curve from S1 to S2. Should water price remains at P0, the shortage will be reduced from Q2Q1 to Q3Q1 where quantity supplied is higher at Q3 and quantity demand remains at Q1.

If supply increase sufficiently to S3, there will no longer be any shortage.



Strategy 1: Advance and productive technology to increase water supply (e.g. desalination and NEWater)

Advance and productive water technology that converts more sea water and sludge water to clean drinkable water are available. In fact Singapore has always been investing in water technology. With continual and greater efforts doing so into the future, more drinkable water can be made available. This will increase the supply of water.

Limitations

However, there will be opportunity cost to the government by investing/ adopting water technologies. The government is foregoing the benefits from allocating the funds into another important area, such as education or healthcare. Furthermore, these new technology are very energy intensive and could result in greater global warming, which in turn further dwindle the supply of water. Hence, to continually desalinate and recycle sludge water is not environmental nor cost sustainable.

Strategy 2: Diversify import sources of water

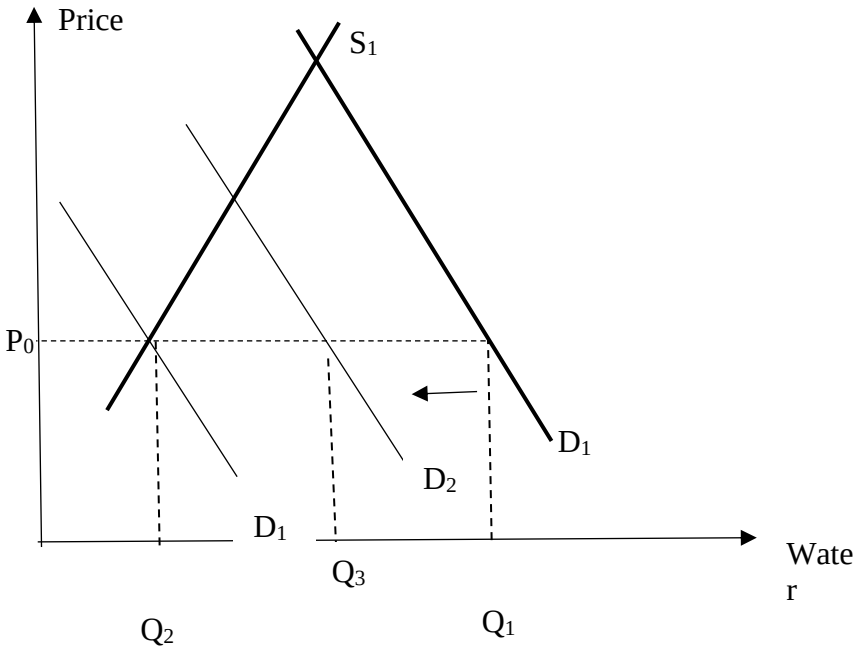
To increase supply of water, Singapore can also diversify our imported water source beyond Malaysia e.g. we can try importing water from other countries such as Vietnam, and Indonesia.

Limitations

However, since water is a necessity and increasingly scarce globally, other countries may not have incentives to export their water supply at all. They would rather keep their water for their own use at home.

Government can reduce the overall demand for water

To reduce the water shortage, government can use regulations to reduce both the domestic and commercial demand for water.



With reference to the diagram, successful strategies to reduce both the domestic and commercial demand for water will shift the overall demand curve from D1 to D2. Should water price remains at P0, the shortage will be reduced from Q2Q1 to Q2Q3, where the quantity supplied is at Q2 and quantity demanded is at Q3. Again, if demand were to fall sufficiently to D1, there will no longer be any shortage.

Strategy 3: Reduce the demand for water by imposing regulations e.g. banning/ restrict non-vital use of water by households, industries and ministries

To reduce demand for water, government can ban or restrict the use of water in non-vital areas such as private swimming pools of households, water-intensive production and services by firms (e.g. semi-conductors, spa, water parks) and outdoor fountains in public parks. These efforts can be complemented with public education/ campaigns to raise awareness of the need to reduce water wastages and requiring firms to label/ rate their products' water efficiency. Doing so may help to reduce the overall demand for water in Singapore.

Limitations

As government impose ban/ restrictions of water usage, particularly on production of goods and services by firms, this may raise firms' cost of production. This may reduce firms' overall profit. This in turn translates to lower economic growth. Hence government may face a trade-off between water conservation and economic growth.

Households can reduce their demand for water

Perhaps, more importantly, households can be more mindful with their choice of water efficient appliances and how they use water, regardless of whether there is any government regulation. E.g. households can choose showerheads that regulate flow to washing machine that use just less water for each load of laundry. Simple actions like taking less time to shower and cutting down on the number of car washes can also help. Some households might even take on a more serious approach in reducing their demand for water such as changing their diets to reduce water-intensive type of food like meat.

Limitations

However, such behavioral changes takes time. Unless, households truly understands the need for water conservatory and have the means to choose more water efficient actions affordably, it is hard for households to reduce their demand for water. Hence there is a need for water efficient appliances to be price more affordably for households as well.

Conclusion

To reduce water shortages, government needs to work on both the demand and supply of water. Water is a scarce resource globally. Hence it is impossible for government to continuously increase the supply of water. It will also be energy nor cost efficient to do so.

Hence a better strategy is to reduce the overall demand for water. Government and households need to partner and collaborate to better manage the demand for water by cutting down water wastages. Non-vital use of water should be stopped so that water can be reallocated to more important areas. This would need a mix of regulations and education.

While reducing demand is more important than increasing the supply of water, decreasing demand for water to reduce wastage may not be easy and take a long time to realise. This is because while regulations are quick fixes, mindset changes on the part of the consumers and producers may not happen quickly. Reducing demand for water may mean a trade-off in welfare. E.g. consumers may have to reduce the quality of life as they reduce activities that involves water e.g. spa treatment, having private pool etc. Producers that uses large anount of water in their production may have to cut down on production and this reduces profits.

Level	Descriptors	Marks
L3	For well-developed explanation, using demand and supply theory and examples, on strategies that both government and household adopt to reduce water shortage.	**8-10**

	Response includes at least one relevant supply-side and one relevant demand-side strategy. Each strategy is evaluated.	
L2	For an explanation, using demand and supply theory and examples, on strategies that both government and household adopt to reduce water shortage. Response may only focus on either supply-side or demand-side strategy. There are some evaluation of strategy.	**5-7**
L1	For a largely irrelevant response or descriptive response with minimal application of demand and supply theory.	**1-4**
Evaluation		
E3	Takes a clear overall stand that is justified by providing convincing evaluative comments on the relative importance of strategies brought up.	**4-5**
E2	Takes a clear overall stand which may be partially justified or unconvincing.	**2-3**
E1	Provides unsubstantiated opinion(s)	**1**

Markers' Comments

- Similarly, this part of the question is similar to the timed trial question that your tutor would have gone through with you during the revision period.
- However, the difference is that you were asked to address the "shortage of" a good with appropriate demand/supply policies instead of the "sharp rise in price" of a good like in the timed trial. It is important to note the difference in focus in order to answer appropriately.
- Most students were not astute enough to spot the difference and gave rehearsed answers to address the former context. This resulted in irrelevant policies such as price ceiling being discussed
    - On the other hand, students who did well exhibited excellent economic analysis, showing both deep content knowledge as well as the ability to apply to a novel context. These students clearly paid attention in class, read their notes and revised their tutorials.
    - Students who performed poorly tended to be those who still displayed conceptual errors in their analysis and structured their essays poorly, resulting in incoherent arguments.
- The topic of demand/supply is still not a well grasped one by many students. To do well in this topic, we need a clarity and accuracy in analysis. Some misconceptions include:
    - "Scarcity" and "shortage" are not synonymous. They are two very different concepts.
    - Poor understanding of shortage.

        - Shortage is a case where Quantity demand (Qdd) > Quantity supplied Qss) as existing price is set ***lower*** than the equilibrium price
    - Given that there question asks to eradicate shortage, it makes no sense to impose price ceiling as it worsens shortage
    - There is no need to reverse shortage to a surplus with a price flooring too.
    - Given that there is a shortage, it makes no sense to impose a "quota on production" i.e. fixing and reducing Qss. A "quota on consumption" i.e. fixing Qdd where Qss will make better sense.
    - Incorrect shifts of curve to illustrate the imposition of tax or subsidy.
        - BOTH the imposition of a tax and subsidy will shift the supply curve. The assumption here is that price is no longer fixed below equilibrium price and it is allowed to adjust to the equilibrium price. At the equilibrium price, the shortage will be eradicated.
        - Tax → reduces water supply → increase in price helps to reduce Qdd
        - Subsidy → increases water supply → decrease in cost of productione helps to increase Qss

Essay Question 8
(Source: 2021 SAJC JC1 H2 FE)

2	About 900 million kg of plastic waste is discarded every year in Singapore. The government has not adopted any bans or charges on single use plastic items like plastic bags, straws and plates. Efforts are aimed at reducing plastic waste through initiatives such as increasing recycling bins and awareness campaigns. The government also offers research grants to companies to develop sustainable waste management technologies.	
(a)	Explain the two possible sources of market failure in the market for plastics.	**[10]**
(b)	Discuss the view that taxation is the best measure to address the issue of plastic waste in Singapore.	**[15]**

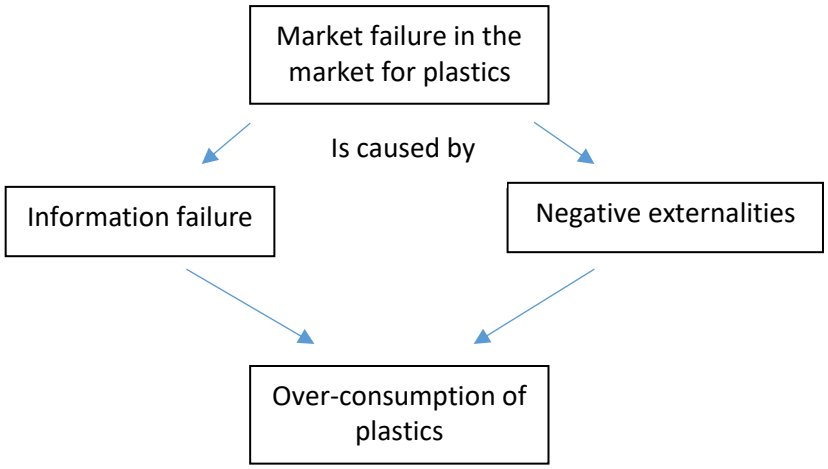
Suggested Answers

Part (a)

Question Analysis

Command word: Explain
Content word: Two possible sources of market failure
Context: Market for plastics

Schematic plan



Introduction

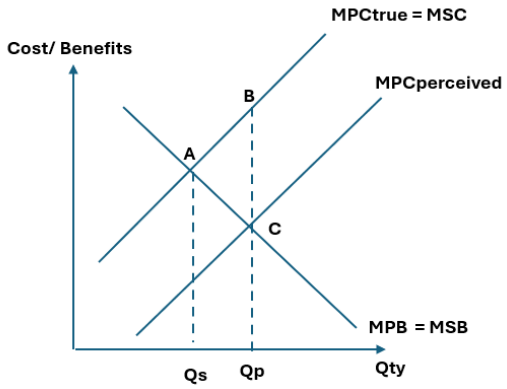
Market failure refers to a situation in which markets produce undesirable outcomes in the form of inefficient resource allocation. The market may not provide the right mix of goods or the optimal amount of a particular good. As a result, the market is not allocating resources efficiently and society's welfare is not maximised.

The 2 sources of market for plastics are 1) information failure and 2) negative externalities generated from the consumption of these goods. As a result, there is an over-consumption of plastics.

Source 1: Information failure

Consumers of plastics have imperfect information about the full impact of using plastics. For example, they underestimate the true private cost of using single-use plastic as they are not aware of the unintended consumption of plastic waste. For

example plastic wastes may clog up the domestic sewage system causing poor drainage, which will bring immense inconvenience to the consumers and reduce their quality of life eventually.
Hence perceived marginal private cost (perceived MPC) of consuming plastics is lower than the true marginal private cost (true MPC) of consuming plastics.

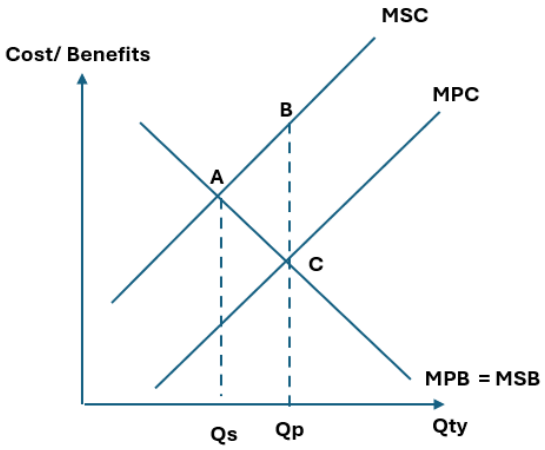


When left to the free market, individuals would consume plastics up to the point where MPB = MPCperceived, at Qp, to maximise their utility. However, the socially optimal level of consumption should be where MSB=MSC at Qs.

Due to information failure, there is an overconsumption of plastics when left to the free market. This causes a deadweight loss of area ABC to be incurred as the social cost of QsQp quantity of plastic overconsumed is QsABQp which is higher than the social benefit of doing so- area QsACQp.

As such, governments would need to intervene in the overallocation of resources to the consumption of plastic to achieve allocative efficiency.

Source 2: Presence of Negative externality
Consumption of plastics generates negative externalities which are costs borne by third parties not involved in the consumption of plastics. Plastic waste can lead to land and water pollution, causing increased health risk in the form of respiratory problems or water poisoning to residents living near waste disposal sites, which will all result in higher medical cost incurred. There could also be severe loss to the marine ecosystems which could lead to income loss by fishermen and tourist industry. Such external costs lead to a divergence between MSC and MPC as shown in Figure 1 where MSC (MPC+MEC) is higher than the MPC of consuming plastics at all levels of consumption.



Assuming there is no presence of positive externalities in the consumption of plastics, MPB=MSB. Driven by self-interest, consumers will maximise utility and base their consumption at Marginal Private Benefit (MPB) = MPC at output Qp.
The socially efficient equilibrium is where society's welfare is maximised at MSB = MSC, and the social optimal output should be Qs.
As Qp is more than Qs, there is overconsumption of plastics by the amount QsQp if the market is left to work freely.
The quantity overconsumed (Q_sQ_p) generated additional social cost of Q_sABFQ_p but only additional social benefit of only Q_sACQ_p, resulting in a deadweight loss of ABC for the society. Hence, there is allocative inefficiency and society's welfare is not maximised

Hence there are two possible sources of market failure in the market for plastics

Mark scheme

Level	Descriptors	Marks
L3	Thorough and clear explanation of the 2 sources of market failure: 1) information failure and 2) negative externalities. Good use of relevant and contextualised examples. Well-referenced and correctly labelled diagrams.	8 – 10
L2	Underdeveloped explanation of the 2 sources of market failure: negative externalities and imperfect information. However, there is minimal use of relevant examples that show application.	5 – 7
L1	Superficial explanation of market failure. Answers may contain conceptual errors and/or diagrams are inaccurate.	1 – 4

Markers' Comments

- Identification of both sources of market failure is key to developing your answers. This part of the question is generally well done by students. Many were awarded close to full credit.

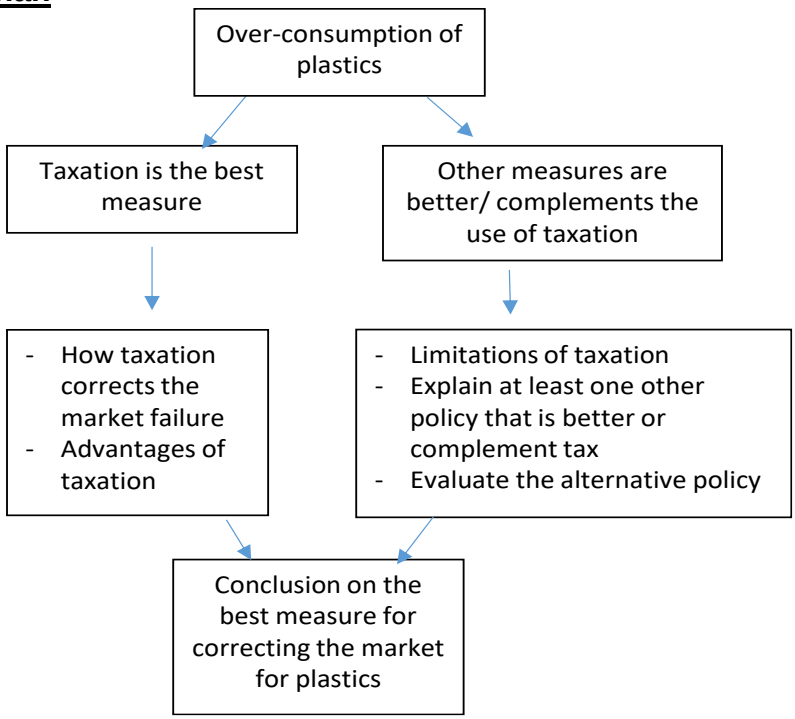
- There are some common mistakes in weaker responses:
  - Wrongly identified that the negative externalities stemmed from production of plastic. It is the CONSUMPTION of plastic that created externalities.
  - Failed to recognize that information failure is concerned with the underestimation of private cost by consumers.
  - Lack clarity and several gaps in explanations. Specifically, key terms are missed out and this compromised the accuracy of responses. These show poor understanding of concepts. E.g.
    - In the case of negative externalities, a third party who was not involved in the consumption of plastics should be clearly identified.
    - In the case of information failure, it is the private costs which consumers are unaware of, not external costs.
    - Wrongly slopped curves (Benefit curves should be downward sloping, and cost curves should be upward sloping)
    - Mislabelling of curves would greatly affect the ability of the essay from identifying Qp and Qs.
    - Some students had difficulties identifying the correct deadweight loss area.
      - ✓ Only a minority of students derived the deadweight loss.

Part (b)

Question Analysis

Command word: Discuss the view
Content word: Taxation, best measure to address the issue of plastics
Context: Market for plastics, Singapore

Schematic plan



Introduction:

Given the market failure in the plastic market, there is a need for the government to intervene in the market for plastic. Taxation is one measure which Singapore government can use to reduce consumption of plastics.

Thesis: Taxation is the best measure for Singapore government to reduce consumption of plastic

Taxation:

- Taxation can be imposed on consumers to discourage them from consuming plastics.
- The amount of tax that the government should impose should equate to marginal external cost (MEC) at Qs.
- The use of indirect specific taxation can be used to internalise the negative externality in the consumption of plastics.
- As seen in Figure 1, the tax will increase the marginal private cost of consuming plastics as illustrated by an upward shift of the MPC curve from MPC to MPC+tax.
- Consumers will thus consume at MPB=MPC+tax, thereby decrease their production from Qp to Qs as illustrated in Figure 2.
- As Qs is the socially optimal output where allocative efficiency is achieved and there is no welfare loss, the market failure is addressed.

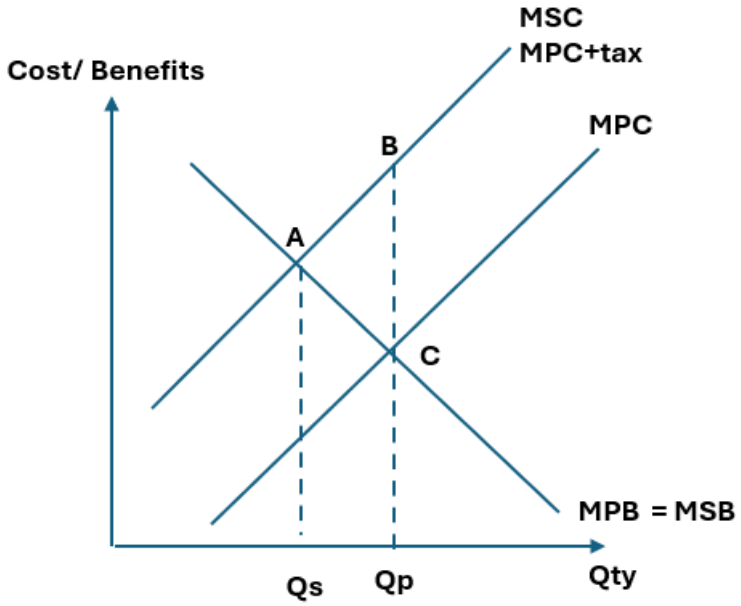


Figure 2: Taxation to address overconsumption of plastics

Advantage of Taxation

- Taxation is easy and quick to implement in the short run, especially if there are already system in place to allow tax revenue collection.
- Taxation generates a source of revenue for the government to fund other policies such as research grants to companies to develop sustainable waste management technologies or public awareness campaigns to reduce information failure in the market for plastics.

Anti-thesis: Taxation has its limitations and complementary use of other policies will better correct the market failure.

- However, it is difficult to estimate the exact MEC as the impact of plastic waste is intangible and hard to quantify. Hence, the government may under-tax or over-tax which does not eliminate the deadweight loss to achieve allocative efficiency.
    - If under-tax, the external cost may be reduced but is not eliminated if the tax is not sufficiently high. However, the outcome is still better than that in the free market because production level is closer to the socially optimum level.
    - If over-tax: output will be lower than the social optimal output. Depending on the error of estimation, deadweight loss may be higher than before taxation.
- A specific per unit tax on plastics is regressive in nature. Assuming PED<1 as plastics is a necessity in daily living, it may worsen equity as lower income groups may face significant increase in expenditure with an increase in price of plastics.

- With rising income and convenience that plastics bring, consumers may continue to consume plastics thus taxes may need to be raised overtime to reduce consumption. It is thus necessary to have other policies to address the other source of market failure which is information failure

Public education:

- The government should also educate and encourage the public to consume less plastic bags and single use plastics by increasing awareness on the unintended increased health effects of microplastics.

- With reference to Figure 3, by being more aware of these costs, consumer's perceived MPC increase to perceived MPC' (which coincides with the true MPC). Consumers will now base their output at Qp' where perceived MPC' =MPB. Consumption at Qp' is also at the social optimal output Qs (or Qtrue).

- Hence deadweight loss is eliminated and allocative efficiency is achieved.

Advantages of Public Education

- While public education is a longer term approach, it is appropriate to change the mindset of Singaporeans to do their part and bear the cost or inconvenience for sustainable growth.
- Once taken effect, a renewed consumer's habits will help to reduce consumption of plastics.

Disadvantages of Public Education

- As public education takes a long time to show effect, it might prove expensive in the long run. Furthermore, it is difficult to measure its effectiveness.
- Public education, if not presented with a viable alternative is not useful at all. Singaporeans tend to value convenience and efficiency provided by plastics. While reusable shopping bags have been provided as an alternative, it has been difficult to cultivate the habit of using shopping bags. The success of public education depends on the receptivity of consumers in changing their habits and whether there is a viable substitute available.

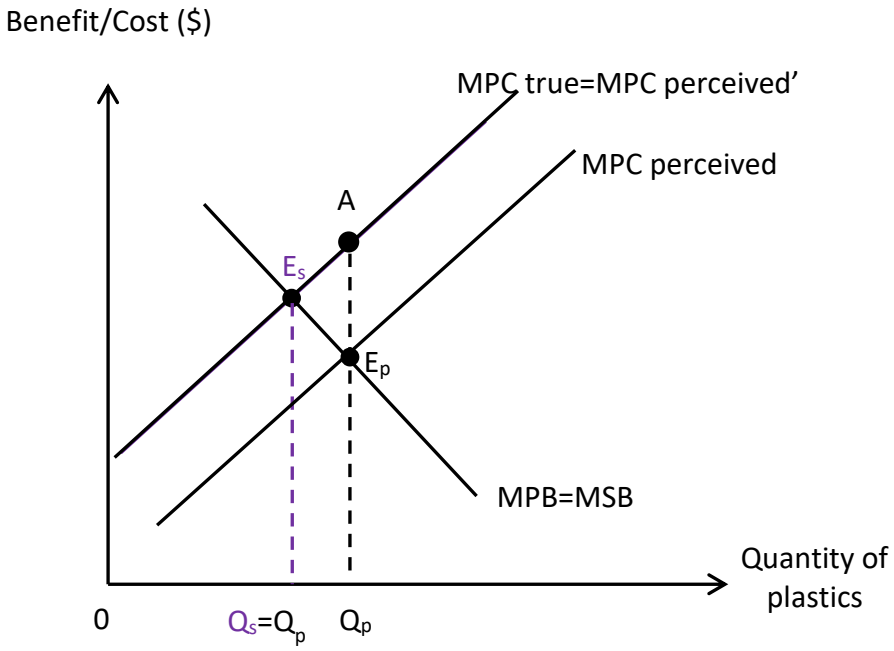


Figure 3: Public Education to address overconsumption of plastics

Ban (on plastic bags and/or single use plastic cutlery)

- A ban can also be placed on non-essential plastic items such as plastic bags and single-use plastic cutlery.
- With reference to Figure 4, when a ban on such items lead to zero consumption of single use plastics, deadweight loss reduced from Area A to Area B as output fell from Qp to zero. Although there is still market failure as a result of under-consumption of single use plastics, deadweight loss is significantly reduced.
- Overtime, this may encourage Singaporeans to adopt environmentally-friendly habits such as bringing a shopping bag and using reusable cutlery since plastic items are not available for their daily use.

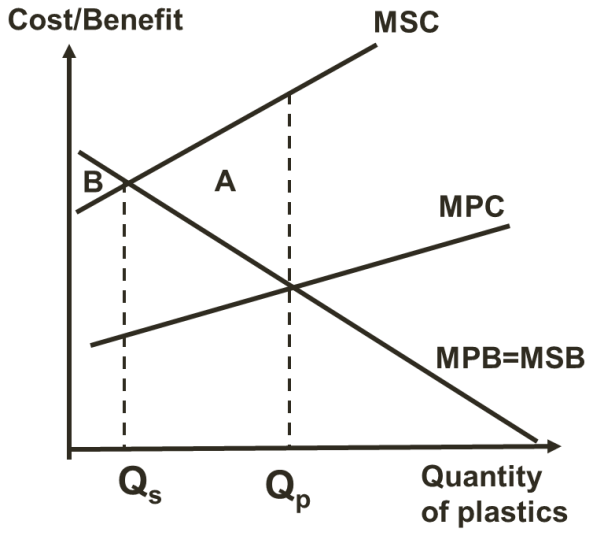


Figure 4: Ban to address overconsumption of plastics (for single use plastics)

Advantages of Ban:

- It is easy to put in action a ban as it is essentially a form of legislation which can be easily announced by the government.

Disadvantages of Ban:

- However, while it is easy to legislate a ban, it may prove hard to implement and monitoring may be needed.
- There were debates on banning plastic bags due to hygiene issues. With Singapore's hot and humid weather, plastic bags could be deemed as necessary to keep groceries fresh or to prevent food contamination. Deadweight loss could be higher if overall hygiene levels fall due to the ban of singe use plastics.
- Businesses will have to find alternative ways to replace plastics in packaging such as using recycled food grade paper products. This will likely lead to higher cost of production. They may pass on the cost to consumers leading to higher prices.

Research grants to companies

Funding can also be given to recycling firms to incentivise them to engage in research and development to develop sustainable waste management technologies.

- With less waste going to landfills, this helps to reduce the divergence between MPC and MSC as MEC is reduced. Output will be closer to social optimal output.

Advantages of research grants

- Reducing external costs of consuming plastics improves sustainability and is a long term solution to correcting the market failure with increasing world population and income spurring the demand for consumer goods including plastics.
- Singapore can play a leading role in waste management technologies and achieve economic growth by attracting FDI in these areas.

Disadvantages of research grants

- Not all research and development yield positive results and thus there is a risk that government funding on years of research may go to waste.
- There are competing uses for government funding. Thus opportunity cost incurred could be in the form of using it to invest in more recycling facilities. Singapore currently recycles less than 10% of its plastics waste.
- Singapore firms may not have the expertise to conduct such research. The success of R&D in sustainable waste management also depends on factors such as technology sharing between countries.

Conclusion and Evaluation

From the analysis above, taxation is not the best measure that the Singapore government can use to tackle the market failure in the consumption of plastics in Singapore as it is inadequate in reducing information failure. Furthermore, with rising income and the surge in demand for single-use plastics in the covid and post-covid period, it is harder for taxation to reduce consumption of plastics.

Singapore may have to consider the possibility of imposing a partial ban on plastics and plastic packaging to reduce the consumption of plastic products, where possible

in the short term. E.g. ban in the use of single plastics for school/ work canteen where staff and students can bring their own containers. In the long term, Singapore can continue to use public education to encourage environmentally friendly habits as well as invest in R&D to reduce the external cost of consuming plastics.
Singapore government should also examine its policies periodically to ensure the policies do not lead to government failure or non-sustainability in other markets. For example, the move from using plastic bags to cotton tote bags have resulted in over-production of cotton tote bags that is water-intensive to make and difficult to recycle.

Level	Descriptors	Marks
L3	Answer is mostly clear with balanced and well-developed explanations of at least two other policies, other than taxation. Answer also recognises that from (a), there are two sources of market failure, so there is some attempt to address both the negative externalities and information failure problem. Consistent use of examples in the Singapore context	8 – 10
L2	Answers that contain two other policies, other than taxation but is partially developed, with some incomplete/undeveloped analysis. Answers that only explains one other policy, other than taxation, though well-explained and well-evaluated. Answers that considered production of plastics instead of consumption of plastics can be capped at L2	5 – 7
L1	Answer contains basic errors of theory, or is mostly irrelevant or inaccurate. Answer is largely descriptive.	1 – 4
E3	For a well-explained judgement that is supported with economic reasoning.	4 – 5
E2	For an under-developed justification of stand made, one that is lacking in economic rigour.	2 – 3
E1	For an unjustified stand/unexplained judgement made. Listing instead of explanation.	1

Markers' Comments

- Most students were able to not only explain how the relevant policies work but also highlight the advantages and limitations of each policy.
- While there were several rehearsed responses, these responses generally met the requirements of the question. Many students were still able to obtain at least mid-range marks.
- Weaker scripts exhibited the following gaps:
    - Lacked breadth in terms of the policies discussed. These scripts failed to include policies to address both negative externalities and information failure in their essay.
    - Provided descriptive explanations, without showing well-developed economic analysis of how each policy works, or supplementing their explanations with a diagram to show how the policy works.

    - Inappropriate framework applied. Demand and supply analysis is not a suitable framework.
        - In the case of market failure, the MSB/MSC framework is used

- There were several strong and insightful conclusive evaluation which provided a clear stand to the question, accompanied by justification with considerations regarding the use of plastics in the context of Singapore.

Essay Question 9
(Source: 2021 SAJC JC1 H2 FE)

3	Singapore saw bubble tea shops proliferated, with a whopping 5,000 shops in 2002. The craze saw a resurgence in 2011 as new Taiwanese bubble tea chains entered the local market. Since then, Singapore has seen two more waves in the drink's popularity - in 2018 and 2019. Some bubble tea chains have planned to open more stores at various petrol stations.	
(a)	Explain why the bubble tea industry is an example of a monopolistic competitive market and the petrol station industry is an example of an oligopolistic market.	**[10]**
(b)	Discuss how a bubble tea shop and a petrol station might compete in their respective market structures.	**[15]**

(a)

Question Analysis

Command	Explain
Content	Features Monopolistic Competition Oligopoly
Context	Nil

Schematic Plan

Monopolistic Competitive Market (e.g. bubble tea shop)

Oligopolistic Market (e.g. petrol pump station)

Characteristics
Number of Firms (market share)
Barriers to entry
Demand Curve
Nature of products
Mutual Interdependence of firms

Introduction

To determine the type of market structure that an industry belongs to, it is important to study the characteristics of each industry. Characteristics include the level of barriers to entry, size of firm, number of firms, nature of products and type of competition
Monopolistic competitive market is characterised by large number of firms (or small market share by each firm), low barriers to entry, price elastic demand curve faced by each firm, slightly differentiated products.
On the other hand, oligopolistic market is characterised by a few large firms, high barriers to entry, price inelastic demand curve faced by each firm, slightly differentiated

or homogenous products. These characteristics result in mutual interdependence between firms.

Body

Number of Firms (Market Share)

In Singapore, there are many brands of bubble tea shops competing with each other – some relatively obscure while others slightly more well-known. Nonetheless, each brand of bubble tea shop still only enjoys a relatively small market share. This means that the output and revenue per shop is also small as we see that each bubble tea shop caters to an often small customer base and mended by only a small number of workers.

In Singapore, despite the fact that there are many petrol stations, each of the petrol station is still owned by one of the few large firm namely Esso, Caltex, Shell and SPC. Hence, each firm enjoys significant market share. Output and revenue of each large firm is likely to be significant as all drivers/motorists can only get their vehicle fuel tank filled up by petrol stations owned by these few large firms.

Barriers to Entry

The bubble tea industry has rather low barriers to entry. For instance, the start-up cost of each brand of bubble tea shop probably simply include rental of shop, ingredients to create the tea, tea brewing machine and a few labour. This explains why there are so many brands of bubble tea shops in Singapore.

The barrier to entry into petrol station industry is likely to be high. For instance, besides rental and labour costs, each pump station is also capital intensive e.g. they need to be fitted with high tech computer systems and extensive petrol pumps/pipes. Given that existing firms e.g. Esso and Caltex, already have large number of petrol stations across Singapore, new entrant will need to be able to compete with sufficient number of petrol stations across Singapore too. This will inevitably incur very high total costs and may face large financial barrier to entry.

Nature of Products

The bubble tea shops generally produce differentiated products, e.g. despite the fact that each bubble tea drink is tea-based, accompanied by boba, it is still differentiated in flavour, in packaging and themes.

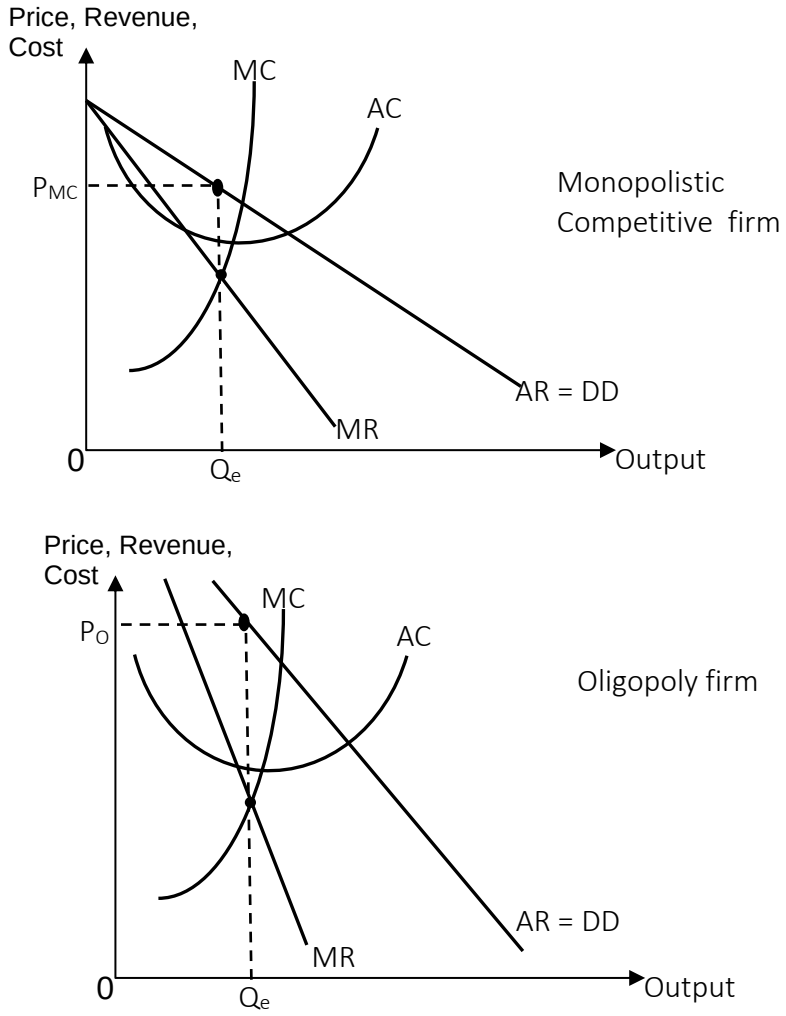
In Singapore only 3 types of fuel are available i.e. 92-Octane Fuel: Low-grade petrol. 95-Octane Fuel: Regular-grade petrol and 98-Octane Fuel: Premium-grade petrol. Albeit different names, each petrol firm (e.g. Esso and Caltex) sells the same types of fuel. Petrol tends to be homogenous in nature.

Price takers and Demand Curves

Each of the bubble tea shop is a price taker and faces a downward sloping demand curve. At the same time, because of the large number of different brands of bubble tea shops present, there are substitutes available for consumers. Hence, each bubble tea shop may face a demand curve that is price elastic. It may also be possible for a firm to face a relatively price inelastic demand curve since the bubble tea firm can produce highly differentiated products to cater to specific taste and preferences of customers.

The petrol firm is also a price taker and faces a downward sloping demand curve. However, the demand curve faced by each existing petrol firm e.g. Esso or Caltex, is more price inelastic given that petrol is a necessity to motorists and that there are only a few petrol brands to choose from.
The downward sloping demand curves and its price elasticities allow differences in different price setting abilities. From the diagrams below, the MC firm has a more price elastic demand curve than the oligopoly firm, and hence, the price set differs as P_{MC} is lower than P_O.

Figure: Profit-maximising output of a Monopolistically Competitive firm and an Oligopoly firm



Mutual Interdependence of firms

The monopolistic competitive bubble tea shops are not mutually dependent in terms of pricing and output. Unlike the bubble tea shops, there is mutual interdependence between the few dominant firms in the petrol station industry due to the significance of each dominant firm's share of the market. Each dominant firm (e.g. Esso) has to consider the pricing and output decisions of the rival firms (e.g. Caltex). Mutual interdependence means that each firm has high rival consciousness as they will be affected by its rival firms' decisions. As a result, prices of petrol tend to be rigid as firms do not have incentive to engage in price competition since lowering their prices would lead to consumers purchasing petrol from other petrol stations. Petrol stations

may also engage in tacit collusion where firms follow the pricing decisions of a price leader.

Conclusion

Hence, the bubble tea industry is an example of a monopolistic competitive market, and the petrol station industry an example of an oligopolistic market.

Level	Descriptors	Marks
L3	Thorough and clear explanation of the characteristics of MC mkt structure and Oligopoly market structure Good use of relevant and contextualised examples i.e. bubble tea market and petrol station market .	8 – 10
L2	Underdeveloped explanation of the characteristics of MC mkt structure and Oligopoly market structure Some relevant and contextualised examples i.e. bubble tea market and petrol station market	5 – 7
L1	Superficial explanation of factors that determine a market structure. Answers may contain conceptual errors	1 – 4

Markers' Comments

- Given the familiar contexts and a rather straightforward question requirement, several students were able to obtain close to full credit.
    - The first part of the essay question is a straightforward one which required students to explain the characteristics of oligopoly using the example of the petrol station industry and monopolistic competitive market using the example of the bubble tea industry.
- Unfortunately, there were also many students who clearly did not understand the characteristics well but still chose to do the question
    - It is important to explain that oligopolistic firms are mutually interdependent too following explanation of key characteristics.

(b) Question Analysis

Command:	Discuss
Content:	2 types of competition: - Price competition/ Strategies to Reduce Cost by MC and Oligopolistic firms - Non-price competition by MC and Oligopolistic firms
Context:	Market for bubble tea Market for petrol station

Schematic Plan

Intro

- Outline that firms in both market structures aim to profit maximise
- Competition include price and non-price competition.

Body

Price competition/ Strategies to Reduce Cost by MC and Oligopolistic firms	Non-price competition by MC and Oligopolistic firms
Lower prices - MC firms can lower price when PED>1 to increase total revenue - Oligopolistic firms may engage in price war even if revenue may fall - Oligopolistic firms may reap iEOS and pass on cost savings to consumers Evaluation on price strategies	Product differentiation - Product Innovation - Product Promotion (Advertising) Evaluation on price strategies

Conclusion

Overall stand regarding which strategy is most effective, given the context

Intro

All monopolistic competitive firms and oligopolistic firms traditionally seek to maximize profit. Their profit maximizing output and price are set at the point where MC=MR. As they profit maximize, firms in both market structures can compete using price and non-price strategies.

Body

Price competition between MC firms

Monopolistically competitive (MC) firms sell differentiated goods and given that MC firms are price setters, they have the ability to set price. Assuming that the availability of substitutes makes the demand curve faced by each firm to be price elastic (PED >1). To increase revenue earned, an MC firm such as a bubble tea shop can compete using price strategy, particularly to reduce price of their product. A reduction in the price of its product would result in a more than proportionate increase in quantity demanded. The revenue gained from the lower prices would therefore be greater than

the lost in revenue lost from selling at a lower price. Assuming no changes in costs, an increase in total revenue implies higher profits for the firm.

Price competition between oligopolistic firms

In general, prices are relatively stable in oligopolistic markets because these firms tend to cooperate (as a cartel or by following a price leader). E.g. petrol prices tend to be sticky/rigid and comparable. This is because there are a few large firms in an oligopolistic industry, each firm owns significant market share each and experiences a high level of mutual interdependent.

However, there are instances where oligopolistic firms engage in price war. Oligopolistic firms may engage in price war for the following reasons:

- Strategy to eliminate new entrants (i.e. Predatory pricing)
- The incumbent firm has a lower cost of production than its rivals and can afford to charge lower to capture a larger market share.
- A new firm seeking to enter a new market might be prepared to sacrifice profits by cutting price to increase its share in a market that is already dominated by several large firms.

Evaluation on price strategies

While both MC firms and Oligopolistic firms can engage in price strategies given that they are price setter, they rarely engage in them. This is because in order to reduce price, firms have to be able to reduce cost of production. Strategies to reduce cost of production may not be straightforward and only effectively in the LR. Particularly for MC firms, their ability to engage in process innovation may be limited given that it earns normal profit in LR. In addition, MC firms might be too small to enjoy as much iEOS as oligopolistic firms to be able to pass cost savings to consumers.

Oligopolistic firms tend to avoid price competition for the key reason to avoid price wars. Price war is not the preferred means of competition in oligopoly as it is likely to result in individual firms suffering losses in the short run. This also means that price wars often last for a very short period of time.

Non-price competition between MC firms

Hence, MC firms generally tend to compete based on product differentiation, rather than price, to survive. There are 2 different ways of non-price competition:

- Product Innovation

  The main aim of product innovation is to produce a product that will sell well and that is different from rivals' product. E.g. each bubble tea shop tries to blend new mixes of bubble tea using different grades of tea or different types of boba. Such product innovations would help to increase demand as well as make demand less price elastic due to fewer close substitutes and greater product differentiation.

- Product Promotion (Advertising)

  Firms can also use advertising and advertising-related activities to make its product unique in the minds of the consumers, even when all products are more or less the same. For example, some bubble tea shop engages social influencers to advertise their drinks.

Non-Price competition between oligopolistic firms

Similarly, oligopolistic firms pursue various non-pricing strategies to boost demand. Like MC firms, oligopolistic firms also engage in product innovation and product promotion.

Because of their ability to earn long run supernormal profits, oligopolistic firms have more ability to engage in R&D and innovation. For example, petrol firms may invest in research to develop cleaner and more efficient energy to increase demand that they face.

In order to promote their product better, we often see petrol firms use various loyalty schemes to reward consumers for their repeated patronage. For example, Esso awards 'Smiles Points' for the purchase of their 'Syngergy' fuel which are redeemable for fuel, convenience store items, etc. To differentiate themselves from other retailers and to attract consumers by providing convenience, all Esso petrol stations feature convenience stores that are managed in co-operation with NTUC FairPrice, either under the 'Cheers' or 'FairPrice Xpress' brand.

Evaluation on non-price strategies

Firms in both market structures tend to prefer non-price completion over price competition. However, a key difference is that most MC firms engage in simple—rather than cutting edge—product innovation as a long run strategy in non-price competition. Even if MC firms have the incentive to engage in product innovation due to the competition amongst the large number of small firms, their inability to earn supernormal profits in the long run hinders their desire to engage in extensive R&D. Hence, a MC firm usually engages in forms of product innovation which do not require such expensive and time consuming R&D, and any form of product innovation occurs at a more superficial level compared to that of an oligopolistic firm.

Conclusion

Whether a firm engages in price competition and non-price competition often depends on the objectives of the firms. For example, a MC firm may wish to lower price if it aims to increase revenue, whereas an oligopolistic firm may wish to engage in predatory pricing to prevent entrant of new firm our so as to capture market share.

Nonetheless, one should indeed see more non-price competitions in the real world between firms in MC and in oligopoly. Some firms will be better at brand differentiation and therefore, they will be able to make supernormal profit. Hence even as we describe the bubble tea industry as monopolistically competitive, some firms e.g. Liho and Koi can be still very profitable over time, so the assumption of normal profits is too simplistic. These firms may have a lot of ability to conduct cutting edge R&D and real product differentiation to compete.

And if these firms have strong brand loyalty and product differentiation, the demand faced by them will be price inelastic. In which case, they can increase price to earn more revenue and consequently profit.

Level	Descriptors	Marks
L3	For well-developed explanation, on price and non-price competition that MC firms and oligopolistic firms engage in.	**8-10**

	Response includes evaluation of the type/differences in price and non-price competition that MC firms and oligopolistic firms engage in.	
L2	For an explanation, on price and non-price competition that MC firms and oligopolistic firms engage in. Response may have some evaluation of the type/differences in price and non-price competition that MC firms and oligopolistic firms engage in. However, they lack clarity or not elaborated.	**5-7**
L1	For a largely irrelevant response or descriptive response with minimal application of firm theory.	**1-4**
Evaluation		
E3	Takes a clear overall stand that is justified by providing convincing evaluative comments on the strategies brought up. E.g. events/ observation that might not fit theory	**4-5**
E2	Takes a clear overall stand which may be partially justified or unconvincing.	**2-3**
E1	Provides unsubstantiated opinion(s)	**1**

Markers' Comments

- This part of the essay question is significantly less well done.
- It is important for student to recognise that the question asks to focus on how firms in different market structures *COMPETE*.
- While many student recognise that strategies can generally be categorised as 1) price strategies and 2) non-price strategies, many students gave rehearsed answers on how firms can increase profit rather than how they COMPETE.
    - While the outcome of a successful competition strategy taken up can increase profit, it is very important to show how competing firms become more superior than rival firms in terms of quality, choice, cost and price of their products.
    - Due to the lack of awareness that question is about competition, some students brought in irrelevant concepts such as merger, price leadership and collusion to increase profit.
        - However, if students were to shape their argument to show how merger and collusion could better position combined firms to compete against other rival firms which may be larger, credit would be awarded.

- Almost all students failed to evaluate the benefits / limitations of each strategy (whether price or non-price strategy to compete). It is important to evaluate any

policy after explaining how it works. This is a recommended approach to discussing strategies.

- Conclusive evaluation were mostly not insightful. Many students merely concluded that both price and non-price strategies were needed to compete. Students could at least compare the differences in terms of the nature of price and non-price competition strategies undertaken between MC firms and oligopolistic firms. E.g.
    - MC firms can adopt pricing competition if the demand they face is price elastic. In which case they can reduce price to compete.
        - Note that increasing price cannot be a form of competition.
    - Oligopolistic firms tend not to engage in price competition given their mutual interdependence. Hence, they choose to engage more in non-price competition.
    - Both MC firms and oligopolistic firms can engage in non-price competition. However, that of MC firms tend to be superficial and less cutting edge due to the inability to earn supernormal profit. Extensive non-price competition may be deemed wasteful and unnecessary given that supernormal profits could be easily eroded away in the long run by competitors given low barriers to entry.

Essay Question 10
(Source: 2022 SAJC JC1 H2 FE)

Lab-grown meat made a historic debut in Singapore at *Restaurant '1880'*. It was introduced by a US start-up *Eat Just Inc* which has plans to build Asia's biggest lab-grown meat facility in Singapore. Meat consumption is projected to increase more than 70% by 2050 and these meat alternatives play an important role in ensuring a secure food supply.

(a) Explain with the use of examples, what might cause price elasticity of demand and cross elasticity of demand to be different for different products. [10]

(b) Assess the likely effects of a fall in price of lab-grown meat on the total expenditure by consumers on lab-grown meat and its related markets. [15]

Suggested Answers for part (a)

Question Analysis	
Command word	**Explain**
Content	**Price elasticity of demand (PED) & Cross elasticity of demand (XED)**
Context	**Examples of different products**

Introduction • Define PED and XED • State that while PED value is always negative and XED values can be positive or negative • State that the magnitude of PED and XED values could be different	
Body 1 Explain the factors that affect magnitude of PED values for different products	**Body 2** Explain the factors that affect the sign and magnitude of XED values for different products

INTRODUCTION

- **Define key terms – PED and XED**

Price elasticity of demand (PED) measures the degree of responsiveness of the quantity demanded for a good or service to a given a change in its price ceteris paribus. On the other hand, cross elasticity of demand measures the degree of responsiveness of demand for a good or a service to a given change in the price of a related good or service, ceteris paribus.

- **Briefly state the main points in the body**

PED values are always negative due to the law of demand, but the magnitude of PED would differ for different products due to factors affecting the PED values such as proportion of income spent on good and availability of close substitutes.

XED values could be positive or negative depending on how the goods are related. The magnitude of XED would differ according to the closeness of the substitutes or complements.

Note: students could use any examples not related to the preamble as long as they illustrate the understanding of the factors affecting the PED & XED.

BODY

<u>First requirement: Explain factors that affect PED for different products</u>

Proportion of income spent on good might differ causing different PED values for different products

➔ **PED for lab-grown meat >1 vs PED for inexpensive food items such as minced chicken/bean curd < 1**

PED for lab-grown meat could be greater than one. Assuming that the cost of producing lab-grown meat is still high which in turn results in relatively more expensive lab-grown meat, the proportion of income spent on the good could be high for an average income earner. Hence, if price of the lab-grown meat were to increase, quantity demanded for lab-grown meat would fall more than proportionately as average income consumers would feel the pinch in their pockets.

However, for other products such as traditional meat such as minced chicken or inexpensive food items such as bean curd, the proportion of income spent on these goods would be relatively smaller. Hence, the PED for these inexpensive food items could be smaller than one as when price of these food items increases, quantity demanded for these inexpensive food items would fall less than proportionately.

Availability of close substitutes might differ for different types of goods causing PED values to be different

➔ **PED for lab-grown meat >1 vs PED for petrol < 1**

PED for lab-grown meant could be greater than one as being a specific type of meat, there could be many other close substitutes such as traditional meat reared or cultured from farms instead from a lab. To satisfy the need of protein intake of a non-vegan consumer, lab-grown meat, which might not be widely acceptable by the public, might be easily replaced by traditional meat in consumers' diet. Hence, if price of the lab-grown meat were to increase, quantity demanded for lab-grown meat would fall more than proportionately as consumers would readily switch to alternatives such a traditional meat item.

However, for petrol, the availability of close substitutes for motorists to run their vehicles is low. Hence, if price of the petrol were to increase, quantity demanded for petrol would fall less than proportionately as consumers would have no other choices but to continue using petrol to drive their cars on the road.

<u>Second requirement: Explain factors that affect XED for different products</u>

The relationship between two goods (i.e. substitutes or complements) would cause XED values for different products to be different in terms of <u>sign</u>

➔ **XED for traditional meat to a given change in price of lab-grown meat is positive vs XED for restaurant dish to a given change in price of wine is negative**

XED for traditional meat to a given change in price of lab-grown meat is positive as lab-grown meat is a substitute for traditional meat. If the price of lab-grown meat were to increase, a consumer would reduce the quantity demanded for lab-grown meat and might turn to traditional meat as an alternative to meet his dietary needs. As a result, demand for traditional meat might increase.

Since XED = $\frac{\%\ change\ in\ demand\ for\ traditional\ meat}{\%\ changein\ price\ of\ lab-grown\ meat}$, the increase in price of lab-grown meat would lead to an increase in demand for traditional meat, thus the value of XED would be positive.

On the other hand, given the complementary nature of the relationship between bread and butter, If the price of butter were to increase, a consumer would likely reduce the quantity demanded for butter. As a result, the demand for the complement- bread, would fall for the consumer.

Since XED = $\frac{\%\ change\ in\ demand\ for\ bread}{\%\ changein\ price\ of\ butter}$, the increase in price of butter would lead to a decrease in demand for bread thus explaining why the value of XED would be negative.

The closeness of substitutes and complements between two goods) would cause XED values for different products to be different in terms of <u>magnitude</u>

XED for traditional meat to a given change in price of lab-grown meat is greater than one as traditional meat is a very close substitute for lab-grown meat as the taste and consistency of traditional meat would be the similar or better than the lab-grown meat. Hence, if price of lab-grown meat were to increase by 10%, consumers would respond very greatly to this increase in price and switch to consume traditional meat very readily. Hence, the demand for traditional meat would increase by more tha proportionately. e.g 15%.

XED for bread to a given change in price of butter would be less than one. This is because butter is a weak complement of bread. To some consumers, it is not necessary to consume butter together with bread. Hence, when price of butter was to increase by 10%, the demand for bread would only fall less than proportionately, say 5%.

<u>Conclusion</u>
In conclusion, the sign of PED is always negative while the sign of XED could be positive or negative depending on the whether the goods are substitutes or complements. The magnitude of PED and XED would be different for different goods based on various factors that affect the consumers' responsiveness to consume the good given the change in the price of the same good or related good.

Mark scheme

Level	Knowledge, Analysis, Understanding and Application	Marks
L3	Thorough knowledge of the facts and theory with an excellent ability to describe & explain in a precise, logical and reasoned manner. **Two requirements** of the questions on **(i) Factors affecting PED** **(ii) Factors affecting XED** This is done and supported by an **appropriate tool of analysis**.	8 – 10
L2	Accurate although undeveloped explanation of the **two requirements** of the questions - on **the factors affecting PED & XED.** There should be evidence of an ability to identify facts, some ability in applying the **appropriate tool of analysis** in explanation.	5 – 7

L1	Answer shows some knowledge but does not indicate that the meaning of the question has been properly grasped. Basic errors of theory or an inadequate development of analysis may be evident. Where the answer is mostly irrelevant and only contain a few valid points made incidentally in an irrelevant context.	1 – 4

Examiners' Comments

Content:

- Definitions of price elasticity of demand (PED) and cross elasticity of demand (XED) provided by students were not accurate.
  Students should take note of the terms bolded and underlined within the definitions of PED and XED shown below:
  - PED measures the degree of responsiveness of the **quantity demanded** for a good or service to a given a change in **its** price ceteris paribus.
  - XED measures the degree of responsiveness of demand for a good or a service to a given change in the **price** of a related good or service, ceteris paribus.

- The main content to answer this question would be factors affecting the PED values as well as factors affecting XED values.
  - Factors affecting the PED values would be 1) proportion of income spent on the good, 2) availability of close substitutes, 3) degree of necessity and lastly 4) time period.
    - Note that to score for the 1st requirement of the question (i.e. PED values for different products), students could just apply 1 or 2 PED factors. There is no need to apply all 4 PED factors to elaborate their answers.
  - Factors affecting the XED values would be 1) relationship of 2 goods i.e. substitutes and complements and 2) closeness of the relationship between the 2 goods.
    - Note that to score for the 2nd requirement (i.e. XED values for different products), students would need to explain ***both the sign*** of XED ***and the magnitude*** of XED values. XED is positive (i.e. **XED>0**) if the 2 goods are substitutes and XED is negative (**XED <0**) if the 2 goods are complements.
    - If the 2 goods are strong substitutes or complements, the **magnitude of XED is greater than one.** On the other hand, if the 2 goods are weak substitutes or complements, the magnitude of **XED is less than one.**
    - Several students did not account for the sign of the XED values. For example, when the 2 goods are substitutes, the students should explain that the XED is positive. Only if the 2 goods are STRONG substitutes, they should further explain that XED >1.

- Students tend to miss out the key phrases "more than or less than proportionately" when they explain the magnitude of PED and/or XED values.

- Some students confused price elasticity of demand (PED) with income elasticity of demand (XED) as these students used terms such as "normal good" and "inferior good". Note that these terms should only be used when there is a change in income. The current question did not contain any content keywords such as "income" nor "income elasticity of demand". Hence, students should not be applying terms such as "normal good" and "inferior good".

Skills:

- Students should learn how to provide a balanced essay by providing an example that illustrates PED>1 and another example that illustrates PED<1. Such an answer would show a more holistic and in-depth understanding of PED values as compared to an answer that show 2 examples that illustrate PED>1.

- Students should also provide more insightful examples as they support their explanation.

Suggested Answers for part (b)

Question Analysis	
Command word	Assess the likely
Content	Effects on total expenditure
Context	Lab-grown meat and related goods such as complements, substitutes and factors of production.

Introduction

- Define total expenditure (TE)
- Set context by establishing the related markets
  - Traditional meat – substitute for lab grown meat
  - Restaurant meals – lab grown meat is a factor of production of restaurant meals
- To analyze the change in the total expenditure given the fall in price of lab-grown meat, the following elasticities of demand concepts are required:
  - Lab-grown meat – PED for lab-grown meat
  - Traditional meat – XED for traditional meat with respect to price of lab-grown meat
  - Restaurant meals – PED for restaurant meals

Body 1	**Body 2**	**Body 3**
Explain how the fall in price of lab grown meat would affect the TE of lab-grown meat given the PED value for lab-grown meat ➔ Fall in price of lab-grown meat due to increase in SS of lab-grown meat ➔ PED > 1 since proportion of Y spent on good is high ➔ With use of DD-SS diagram, explain that TE on lab-grown meat would increase.	Explain how the fall in price in lab-grown meat would affect the TE of substitutes such as traditional meat given the XED value of traditional meat ➔ XED for traditional meat with respect to price of lab-grown meat > 0 → demand for traditional meat falls. ➔ XED for traditional meat with respect to price of lab-grown meat > 1 → demand for traditional meat falls more than proportionately ➔ With use of DD-SS diagram, explain that TE on traditional meat fall by a large extent	Explain how the fall in price in lab-grown meat affect the supply of restaurant meals and hence the price of restaurant meals Explain how the change in price of restaurant meals would affect the TE of restaurant meals given the PED values of restaurant meals. ➔ Lab-grown meat is a fop of restaurant meals ➔ PED for restaurant meals that serve lab-grown meat < 1 due to lack of close substitutes and high degree of necessity to try new food trends ➔ With use of DD-SS diagram, explain that TE on restaurant meals that

		serve lab-grown meat would fall.
Conclusion • Summarize the impact on the TE of lab-grown meat and on the related market • Question the ceteris-paribus assumption based on different context and situation and explain how the TE on various markets would have been affected differently		

INTRODUCTION

- Define key terms i.e. total expenditure (TE)
  - Total expenditure refers to total spending on the good by the consumers in the market.
  - TE = market price x quantity bought in the market (i,e TE = P x Q)

- Set context by establishing the related markets
  - Traditional meat – substitute for lab grown meat
  - Restaurant meals – lab grown meat is a factor of production of restaurant meals

- To analyze the change in the total expenditure given the fall in price of lab-grown meat, the following elasticities of demand concepts are required:
  - Lab-grown meat – PED for lab-grown meat
  - Traditional meat – XED for traditional meat with respect to price of lab-grown meat
  - Restaurant meals – PED for restaurant meals

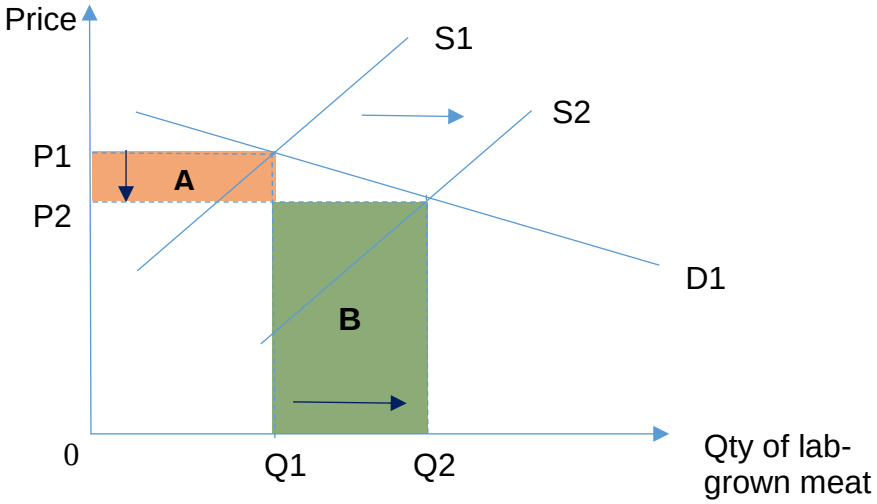
BODY 1

Explain how the fall in price of lab grown meat would affect the TE of lab-grown meat given the PED value for lab-grown meat

The fall in price of lab-grown meat could be due to the increase in supply of lab-grown meat caused by the increase in investment in the production of lab-grown meat through building the biggest lab-grown meat facility in Singapore. As shown in the diagram below, an increase in supply of lab-grown meat from S1 to S2 would cause the price to fall from P1 to P2.

As explained in part (a), PED for lab-grown meat is likely to be greater than one as there could be many closer substitutes for lab-grown meat such as traditional meat which is more readily available. Furthermore, the proportion of income spent on the lab-grown meat might be high for an average income earner as the lab-grown meat might still be relatively more expensive.

Given that the likely value of PED for lab-grown meat is greater than one, a fall in price would lead to a more than proportionate increase in quantity demanded for lab-grown meat, ceteris paribus. Since TE = P x Q, there would be a net increase in the TE on lab-grown meat as the loss in TE due to the fall in price (shown by Area A) would be less than the gain in TE due to the more than proportionate increase in quantity demanded (shown by Area B).



BODY 2

Explain how the fall in price in lab-grown meat would affect the TE of substitutes such as traditional meat given the XED value of traditional meat.

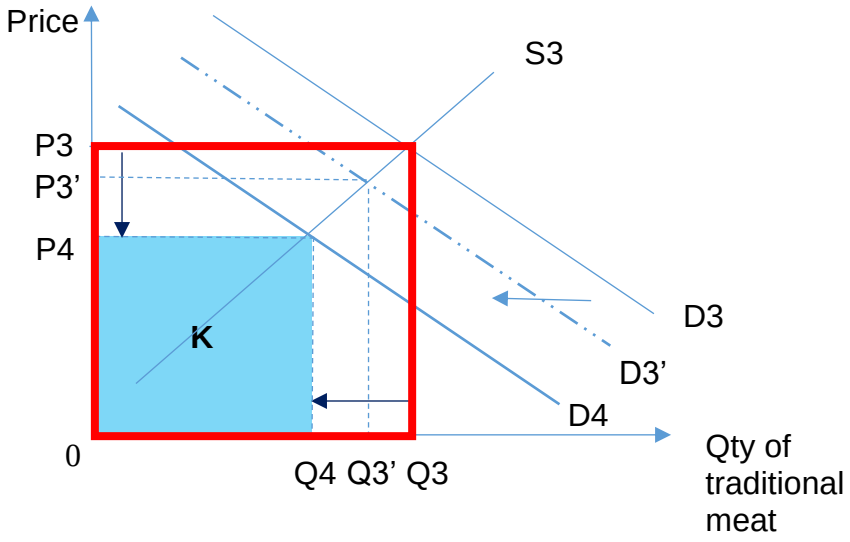
The fall in price of lab-grown meat might cause demand for substitute such as traditional meat to fall as XED for traditional meat with respect to price of lab-grown meat is positive.

However, the extent to which the demand for traditional meat would fall would largely depend on the XED value between lab-grown meat and traditional meat.

As mentioned in part (a), assuming that the XED value for traditional meat with respect to price of lab-grown meat is greater than one as traditional meat is considered as a close substitute for lab-grown meat, this would mean that the demand for traditional meat would decrease more than proportionately from D3 to D4. With reference to the diagram below, as the demand for traditional meat decreases from D3 to D4, the equilibrium price of traditional meat would decrease from P3 to P4 and the equilibrium quantity would decrease from Q3 to Q4. Since TE = P x Q, there would be a decrease in the TE on traditional meat.

However, for consumers who deem lab-grown meat and traditional meat as weak substitutes, the XED value would thus likely be less than one. This is especially so since consumers may take time to accept lab-grown meat as a direct replacement for traditional meat.

As a result of this, we would see that the demand for traditional meat would decrease less than proportionately from D3 to D3' instead. With reference to the diagram below, the equilibrium price would now fall from P3 to P3' instead and Q3 would fall to Q3'. Since TE = P x Q, there would be a decrease in the TE on traditional meat. However, this fall would be smaller than the fall seen if XED was greater than one instead.



BODY 3

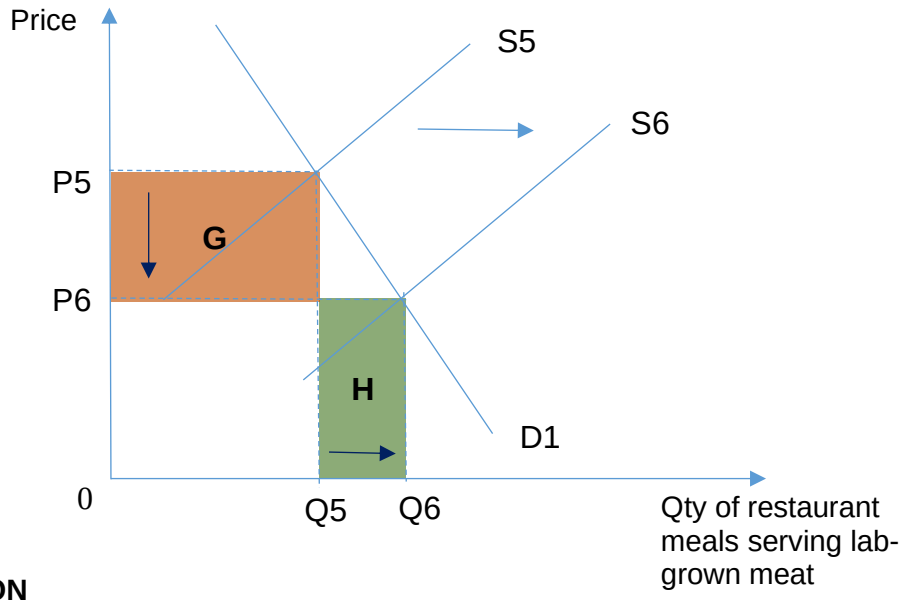
Explain how the fall in price in lab-grown meat would affect the supply of restaurant meals and hence the price of restaurant meals

Lab-grown meat is a factor of production of restaurant meals as seen in the case of being served in Restaurant 1880 in Singapore. When price of lab-grown meat falls, the supply of restaurant meals increases as cost of production would fall. As shown in the diagram below, the increase in supply of the restaurant meals from S5 to S6, would cause the price of restaurant meals to fall from P5 to P6.

Explain how the change in price of restaurant meals would affect the TE of restaurant meals given the PED values of restaurant meals.

The PED for restaurant meals is likely to be less than one as consumers who patronize such restaurants that serve lab-grown meat would have a strong preference or necessity to try the 'extraordinary' meals serve in these restaurants, Furthermore, the number of restaurants that serve lab-grown meat might just be only a few in Singapore. Hence, due to a few close substitutes. PED for restaurant meals that serve lab-grown food is less than one.

Given that the likely value of PED for restaurant meals is less than one, a fall in price would lead to a less than proportionate increase in quantity demanded for restaurant meals, ceteris paribus. Since TE = P x Q, there would be a net decrease in the TE on lab-grown meat as the loss in TE due to the fall in price (shown by Area G) would be greater than the gain in TE due to the less than proportionate increase in quantity demanded (shown by Area H).



CONCLUSION

In conclusion, when price of the lab-grown meat falls, the TE on lab-grown meat would increase. The TE on related markets such as traditional meat and restaurant meals that serve lab-grown meat would both fall.

However, the impact on the TE on these goods is based on the ceteris paribus assumptions.

Lab-grown meat market: Question the PED value of lab-grown meat → PED>1?

It is assumed that the PED for lab-grown meat is likely to be greater than one as currently, lab-grown meat might not be widely available and might not be generally accepted by the public. Hence, currently, lab-grown meat is seen to be easily replaced by many close substitutes. However, in the future, should there be more advanced food technology that causes lab-grown meat to become the more popular meat that forms part of our daily diet, PED for lab-grown food might be less than one. Hence, in the future, should price of lab-grown meat falls, TE may fall instead.

Traditional meat market: Question the fall in demand for traditional meat? Would it necessarily fall when price of lab-grown meat falls?

For the traditional meat market, it is assumed that TE falls due to fall in its demand caused by the fall in price of lab-grown meat. However, if there was an increase in income occurring at the same time, given that meat is a normal good, demand for traditional meat might increase. Thus, the overall outcome on TE would depend on the extent of change in demand after taking into account both the events of the fall in price of lab-grown meat as well as the rise in incomes.

Restaurant meals that serve lab-grown meat market: Question the assumption of the demand for restaurant meal being constant.

For the restaurant meals that serve lab-grown meat, TE may not fall as these restaurants may have engage in non-price strategy to hype up the popularity of the dishes through advertising and this might increase the demand for their meals. Hence, even if there is a fall in price of lab-grown meat and given that PED<1 for the meals, TE for restaurant meals that serve lab-grown meat might increase.

Mark Scheme

Level	Knowledge, Analysis, Understanding and Application	Marks
L3	Thorough knowledge of the facts and theory with an excellent ability to describe & explain in a precise, logical and reasoned manner. **Two requirements** of the questions on **(i)** The effect of TE on lab-grown meat given a fall in price of lab-grown meat **(ii)** The effect of TE on related markets given a fall in price of lab-grown meat This is done and supported by an **appropriate tool of analysis**. Able to apply to the context of lab-grown meat and its related markets with appropriate examples.	8 – 10
L2	Accurate although undeveloped explanation of the **two requirements** of the questions. There should be evidence of an ability to explain the effects of TE on lab-grown meat as well as related markets given a fall in price of lab-grown meat via use of **appropriate tool of analysis**.	5 – 7
L1	Answer shows some knowledge but does not indicate that the meaning of the question has been properly grasped. Basic errors of theory or an inadequate development of analysis may be evident. Where the answer is mostly irrelevant and only contain a few valid points made incidentally in an irrelevant context.	1 – 4
E3	Well explained evaluative judgments about 2 requirements + a summative conclusion	5
E2	Evaluative judgments about 2 requirements, one of which is well-explained	3 – 4
E1	Unsupported evaluative statements or one explained evaluative judgment	1 – 2

Examiners' Comments

Content:

- Some students made a serious conceptual error by explaining that the demand for lab-grown meat has increased and hence the demand curve shifted to the right when there is a fall in price of lab-grown meat.
    - Note that this is not correct as when there is a price fall, there should be a change in QUANTITY DEMANDED for lab-grown meat, which should be illustrated by a MOVEMENT DOWN ALONG the demand curve for lab-grown meat.
    - Students should learn that there is a difference between "demand" and "quantity demanded" and should not be using them interchangeably.

- The link to the concept of total expenditure is lacking in several students' essays. Note that total expenditure is calcuated as market equilibrium price x quantity bought by the consumers in the MARKET. Hence, the tool of analysis should be demand and suppy analysis and not firm's analysis.
    - It is observed that students who drew DD-SS diagram showing how the areas of total expenditure is affected tend to be more analytical.

- Some students linked to the concept of total revenue instead of total expenditure, which should not be the case as the question stated the content word "total expenditure".

- Also note that the concept of total expenditure is not the same as consumer surplus as some students errorneously explained the impact on consumer surplus in their essays instead of explaining the impact on total expenditure.

- Several students did not apply the concept of PED as they explained the impact on total expenditure on lab-grown meat when there is a price fall caused by an increase in supply curve.

Skills:

- Many students lack evaluation skills as they did not attempt to question ceteris paribus assumptions as they conclude their essays.

Essay Question 11
(Source: 2022 SAJC JC1 H2 FE)

Question 2:

People in Singapore are becoming less healthy. Not only do Singaporeans undervalue the importance of exercise in preventing chronic diseases, but they are also seemingly unaware of how much physical activity is required to achieve their desired health benefits. The Singapore Physical Activity Guidelines (SPAG) was unveiled in June this year. It aims to provide Singaporeans with recommendations on physical activities to reduce sedentary behaviour as well as information on types of exercises suitable for different age groups and lifestyles.

(a) Explain why, if left to market forces, there may be an undesirable allocation of resources for exercising. [10]

(b) Assess if government intervention in the above market for exercising will bring about an efficient allocation of resources. [15]

Suggested Answers

Question Analysis

Command Word	Explain
Content Word	Left to market forces, undesirable allocation of resources
Context	Exercising

Schematic Plan

Introduction Overview of market failure	
Requirement 1 Explain how positive externalities in consumption lead to an undesirable allocation of resources	**Requirement 2** Explain how information failure lead to an undesirable allocation of resources
Conclusion Explain how both sources of market failure lead to an undesirable allocation of resources for exercising	

Introduction

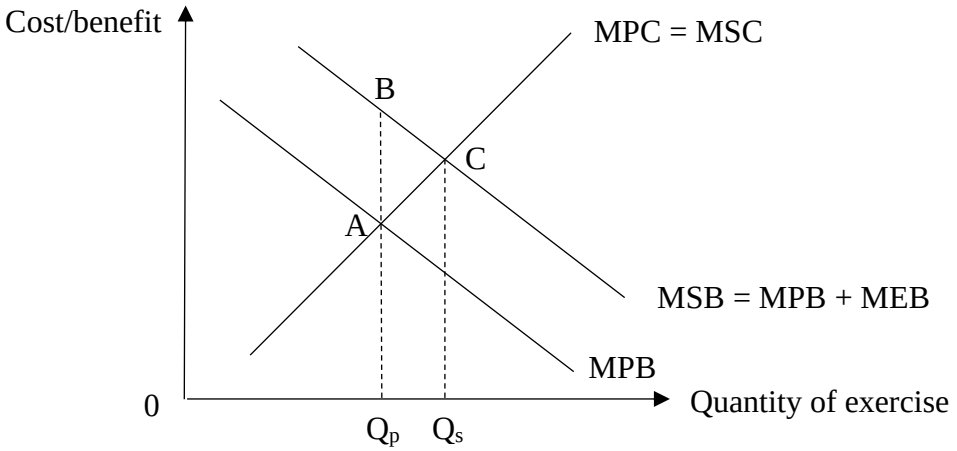
- Define market failure
- Exercising presents two possible cases of market failure:

1. Positive externalities in consumption
2. Information failure

Body

Source #1: Positive externalities in consumption

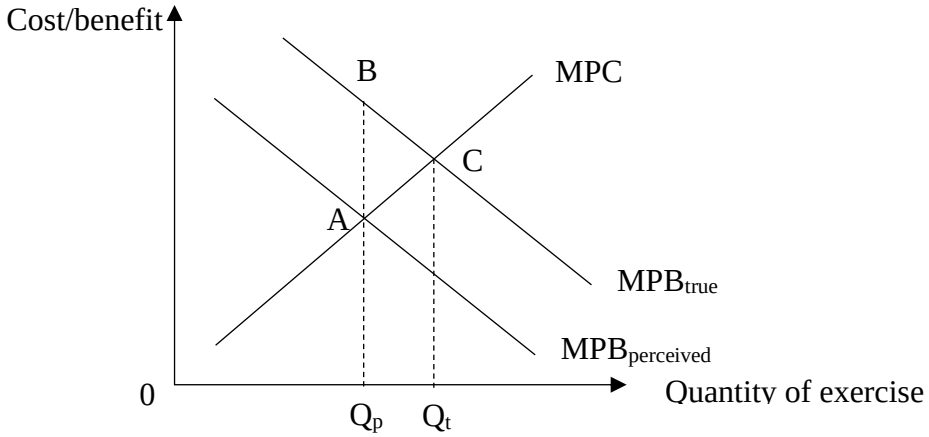
The consumption of exercise generates positive externalities as it helps to keep people healthy and prevent chronic diseases, allowing for our workforce to be more productive and contribute more to the national output of our country. As such, this causes a divergence between marginal social benefit (MSB) and marginal private benefit (MPB) due to the marginal external benefit from the consumption of exercise, where MSB > MPB. Assuming there are no negative externalities, marginal social cost (MSC) will be equal to marginal private cost (MPC).



As consumers are driven by self-interest, they will seek to maximise their own utility and will consume exercise at the point where MPB = MPC, at $0Q_p$. However, from society's perspective, the socially optimal level of consumption is found where MSB = MSC, at $0Q_s$. As the socially optimal level of consumption of exercise exceeds the private level of consumption, there is an under-consumption of exercise. The under-consumption of Q_pQ_s units of exercise generates an additional social benefit of area Q_pBCQ_s, whereas under-consumption of Q_pQ_s units of exercise generates an additional social cost of area Q_pACQ_s. Hence, there is a net benefit lost of area ABC. Hence, there is allocative inefficiency in the market, resulting in market failure arising.

Source #2: Information failure

There is also information failure in the consumption of exercise. Many people underestimate the benefits of exercising as they undervalue the benefits of exercising, resulting in a divergence between the $MPB_{perceived}$ and MPB_{true} of exercising.



If left to the free market, consumers will choose to consume where $MPB_{perceived}$ = MPC, at $0Q_p$. However, the optimal level of consumption, assuming no information failure, would be found where MPB_{true} = MPC, at $0Q_t$. As the level of consumption without

information failure exceeds that of the level of consumption due to information failure, there is an under-consumption of exercise. The under-consumption of Q_pQ_t units of exercise generates an additional private benefit of area Q_pBCQ_t, whereas under-consumption of Q_pQ_t units of exercise generates an additional social cost of area Q_pACQ_t. Hence, there is a net benefit lost of area ABC. Hence, there is allocative inefficiency in the market, resulting in market failure arising.

Conclusion

Hence, exercising presents two cases of market failure – positive externalities in consumption and information failure. Due to the sources of market failure, the government may need to intervene in the market to bring about an efficient allocation of resources.

Mark scheme

Level	Knowledge, Analysis, Understanding and Application	Marks
L3	Thorough knowledge of the facts and theory with an excellent ability to describe & explain in a precise, logical and reasoned manner. **Two requirements** of the questions on **(i) The presence of positive externalities in consumption in context of exercising and how it leads to an undesirable allocation of resource when left to free market** **(ii) The presence of information failure in context of exercising and how it leads to an undesirable allocation of resource when left to free market** This is done and supported by an **appropriate tool of analysis**.	8 – 10
L2	Accurate although undeveloped explanation of the **two requirements** of the questions – **(i) the presence of positive externalities in consumption in context of exercising and how it leads to an undesirable allocation of resource when left to free market** **(ii) The presence of information failure in context of exercising and how it leads to an undesirable allocation of resource when left to free market** There should be evidence of an ability to identify facts, some ability in applying the **appropriate tool of analysis** in explanation.	5 – 7
L1	Answer shows some knowledge but does not indicate that the meaning of the question has been properly grasped. Basic errors of theory or an inadequate development of analysis may be evident. Where the answer is mostly irrelevant and only contain a few valid points made incidentally in an irrelevant context.	1 – 4

Examiners' Comments
Content:

While most were able to accurately identify that this was a market failure question, a small handful of students used demand-supply analysis to answer the question, rendering their responses largely irrelevant.

This question required the explanation of two sources of market failure; however, a fair number of students only managed to identify one source of market failure, limiting the scope of their answer.

Some common mistakes include misidentifying one of the sources of market failure as negative externalities in consumption. This is inaccurate as this would only identify with the possibility of third-party costs because of not exercising, rather than when consuming exercise. There is no such market for not exercising so this method of thinking cannot be accepted.

A fair number of students drew their market failure diagrams incorrectly. Common errors include:

1. Downward-sloping cost curves and upward-sloping benefit curves when it should be downward-sloping benefit curves and upward-sloping cost curves.
2. Inaccurately drawn cost curves e.g. $MPC_{perceived} > MPC_{true}$ should be drawn with $MPC_{perceived}$ to the left of MPC_{true}, whereas many drew it to the right instead.
3. Wrong area of DWL identified
4. Inaccurately labelled axes e.g., y-axis as price, instead of cost/benefit etc.

While most answers understood the requirements of the questions, many had gaps in their explanations such as missing out explanation on the divergences of the benefit curves, or how the utility-maximising and socially optimal level of consumption can be found.

Skills:

There should be more attention given to contextualising examples to suit the question. A fair number of responses gave generic explanations without consideration of the context of the question, reducing the overall quality of the answer.

Suggested Answer (b)

Question Analysis

Command Word	Assess
Content Word	Government intervention, efficient allocation of resources
Context	Exercising

Schematic Plan

Introduction Explain why government intervention is required	
Requirement 1 Explain how government intervention may bring about an efficient allocation of resources • Explain workings of policies with cost-benefit analysis for both sources of market failure	**Requirement 2** Explain how government intervention may not bring about an efficient allocation of resources • Explain limitations of the policies • Explain possibility of government failure
Evaluation Explain the criteria that determines how far government intervention brings about an efficient allocation of resources.	

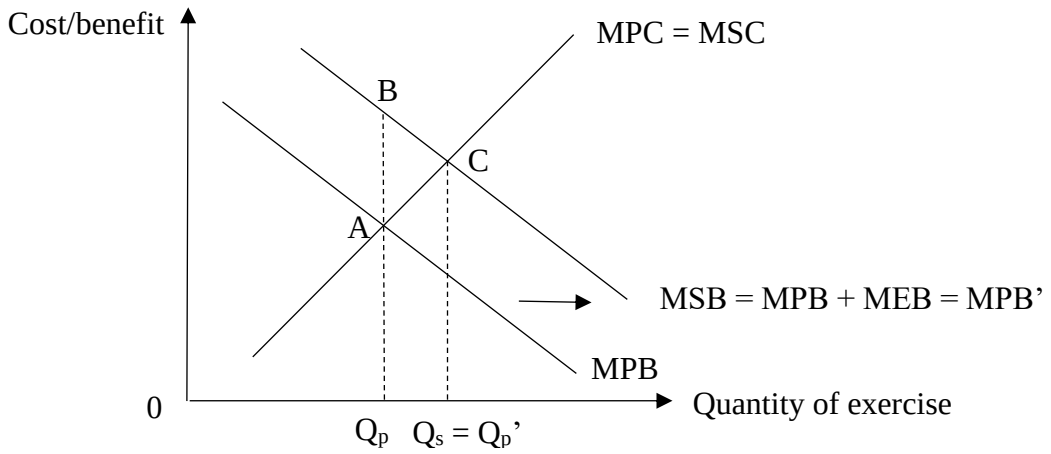
Introduction

- Brief explanation of why government intervention is required
- Overview of policies that can be used to address the above market failures

Thesis #1: Government intervention for positive externalities in consumption

Subsidies

The government may intervene to encourage greater consumption of exercise through subsidies. For example, ActiveSG was launched in Singapore to allow ample opportunities to experience and share the joy of living better through sport. All Singaporeans and permanent residents can sign up for membership free, and this would give them $100 ActiveSG credit that can be used for swimming complexes, gym admissions, payment for ActiveSG programmes and activities etc. This ActiveSG credit can be seen as a subsidy on sporting facilities and programmes that may encourage greater uptake in exercise, increasing consumers MPB to MPB' of consuming exercise, assuming a per unit subsidy equal to MEB. Ceteris paribus, the new level of private consumption would be found where MPB' = MPC, at Q_p' (= Q_s). This eliminates the under-consumption of exercise as well as the deadweight loss in the market.



Note: Students may also choose any other relevant policies that may be used to deal with positive externalities in consumption.

Strengths of subsidising to encourage greater consumption of exercise is that consumers will now internalise the positive externality and consume at a level of consumption that is closer to the socially level of consumption of exercise. Furthermore, subsiding also improves equity and reduces social exclusion, as lower income households who may not have access to such facilities for exercising purposes are now better able to.

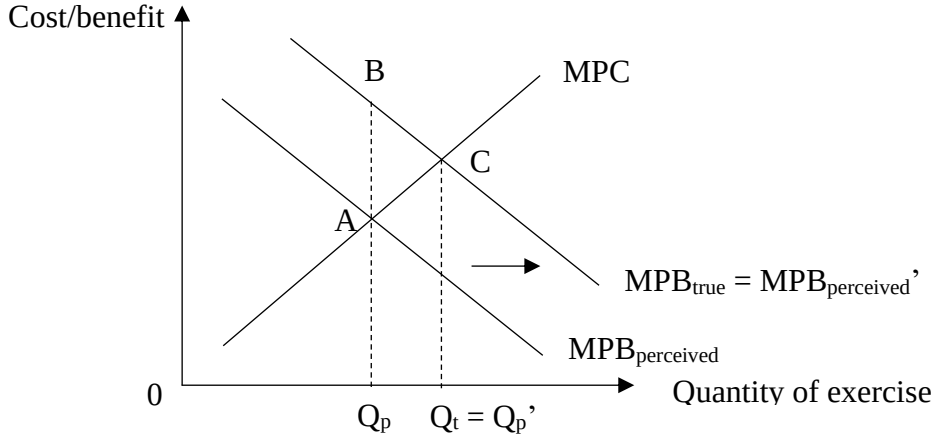
Anti-thesis #1: Limitations of subsidies

A limitation of subsidising exercising is that is the opportunity cost incurred by the government to fund the subsidy as they will not be able to use these funds to meet the needs of other markets, for example, in education, which generates positive externalities in consumption as well. Moreover, it would be difficult to estimate the monetary value of MEB to accurately subsidise such that it eliminates any under-consumption and deadweight loss in the market. Therefore, government intervention may not bring about an efficient allocation of resources.

Thesis #2: Government intervention for information failure

Public education

As there is also information failure that exists in the market, hence, the government will also need to correct the information failure to improve resource allocation in the market for exercise. The government may intervene to encourage greater consumption of exercise through public education. The Singapore Physical Activity Guidelines (SPAG) may be viewed as a form of public education as it helps to bridge the information gap by providing greater information on how much physical activity is required to achieve their desired health benefits, increasing consumer's $MPB_{perceived}$ of exercise to $MPB_{perceived}$'. The new equilibrium level of private consumption of exercise would be where $MPB_{perceived}$' = MPC, at Q_p' (= Q_t), eliminating any under-consumption of exercise as well as the deadweight loss, correcting the market failure.



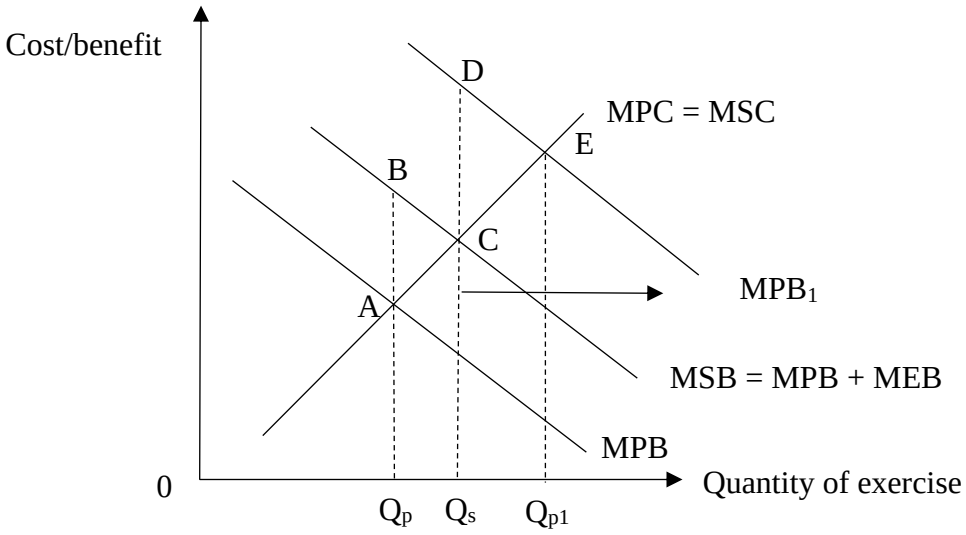
A strength of public education as a policy is that it effectively deals with the root cause of the problem. It is likely that the market failure arising from information failure is the larger contributing factor to an allocatively inefficient allocation of resources than positive externalities in consumption. Hence, public education should help correct the under-consumption of exercise to a larger degree.

Anti-thesis #2: Limitations of public education

A limitation of public education is that it may require a change in mindset of the consumers to further encourage consumption of exercise. Many may find that although they may have a better idea of the type of exercises suitable for their age groups and lifestyle etc. to better attain their desired health benefits, given the demanding and fast-paced nature of Singapore's society, exercise may still be put to a lower priority and hence may not increase consumption of exercise by much. Thus, government intervention may not necessarily bring about an efficient allocation of resources.

Anti-thesis #3: Government failure

Lastly, in the rare case of government failure, government intervention may result in an allocation of resources that is more suboptimal than prior to intervention. For example, if the \$100 ActiveSG credit caused a large increase in MPB from MPB to MPB$_1$, due to lack of or poor information, this may cause an over-consumption of exercise that may cause a larger market failure than before.



From the diagram, government intervention would have resulted in the under-consumption of exercise of Q_pQ_s units to an over-consumption of exercise to Q_sQ_{p1} units instead, resulting in a deadweight loss of area CDE instead of area ABC, which shows a larger welfare loss to society. In such a case scenario, government intervention does not bring about an efficient allocation of resources.

Note: Students may also choose to discuss any other reason that may contribute to government failure.

Evaluation

How far government intervention will bring about an efficient allocation of resources depends on:

1. Mitigating factors contributing to limited success of chosen policy/policies

   E.g. Accurate information may help with achieving an efficient allocation of resources in the case of subsidising consumers to encourage greater consumption of exercise. Failing which, government may not have the precise information required to completely eradicate the market failure.

   It is, however, worth noting that this is rather difficult to achieve in the real world due to imperfect information in most, if not all, markets and hence, it is unlikely that market failure can completely corrected despite a government's choice of policy/policies.

2. The likelihood of experiencing government failure

   The likelihood of government failure arising from government intervention can reduced with accurate information, good planning, weighing out costs and benefits as well as careful consideration of potential pitfalls from the implementation of policies in view of the competing needs of the economy. Oftentimes, developed countries with the ability to obtain better and more accurate data are placed at an advantage as they would be able to implement policies more accurately and hence effectively, avoiding a case scenario of government failure. It should also be noted that review of government policies is important due to our everchanging economic landscape to help prevent government failure from arising.

Mark Scheme

Level	Knowledge, Analysis, Understanding and Application	Marks
L3	Thorough knowledge of the facts and theory with an excellent ability to describe & explain in a precise, logical and reasoned manner. **Two requirements** of the questions on **(i)** The case where government intervention would bring about an efficient allocation of resources. **(ii)** The case where government intervention would not bring about an efficient allocation of resources This is done and supported by an **appropriate tool of analysis**. Able to apply to the context of exercising with appropriate examples.	8 – 10

L2	Accurate although undeveloped explanation of the **two requirements** of the questions. There should be evidence of an ability to explain the case for and against the use of government intervention to bring about an efficient allocation of resources via use of **appropriate tool of analysis**.	5 – 7
L1	Answer shows some knowledge but does not indicate that the meaning of the question has been properly grasped. Basic errors of theory or an inadequate development of analysis may be evident. Where the answer is mostly irrelevant and only contain a few valid points made incidentally in an irrelevant context.	1 – 4
E3	Well explained evaluative judgments about 2 requirements + a summative conclusion	5
E2	Evaluative judgments about 2 requirements, one of which is well-explained	3 – 4
E1	Unsupported evaluative statements or one explained evaluative judgment	1 – 2

Examiners' Comments
Content:

Many of the answers for this question were very descriptive in nature. As such, it lacked the relevant economic analysis to support the point. The expectation is for students to use cost-benefit analysis to explain how the policy works e.g., a subsidy given to the producer reduces their cost of production, resulting in an increase in supply of exercise-related products/services, decreasing prices, ceteris paribus. Hence, this reduces the MPC of consumers, shifting MPC from MPC to MPC'.

For those who did explain the relevant shifts in the curves, few made it a point to draw links to how it resulted in an improvement in resource allocation. E.g. consumers will now consume at the new utility-maximising point where MPC' = MPB, $0Q_p' = 0Q_s$, hence eliminating the deadweight loss.

The same issue also extended to many of the paragraphs address the limitations of the given policy, and it lacked connection to the question as often, students did not relate back to the question to address how the limitations of the policy affected resource allocation in the market.

There were a fair number of responses with errors from part (a) that were carried forward. E.g., only one source of market failure identified in part (a), thus affecting the range of policies explained in part (b), and inaccurate source of market failure in part (a), resulting in incorrect policies chosen in part (b).

For the handful of students who chose to explain the possibility of government failure in their answer, many did not properly understand the meaning of government failure and said that over-subsidising would cause government failure. This, however, is untrue as it depends on the extent of over-subsidising. Government failure arises when government intervention causes a larger degree of market failure than prior to intervention. Hence, not all cases of over-subsidising would give rise to government failure.

Skills:

Similar to part (a), many responses were largely theoretical without attempt to contextualise the choice of policies to the context of the question.

Evaluation for this question was very averagely done. Many of the evaluative paragraphs were largely repetitive and brought up points that were previously mentioned in the body paragraph. It should be noted that the point of the evaluative paragraph is for the student to synthesise their answers – given that there have been points raised that show how 1. Government intervention may bring about an efficient allocation of resources, and 2. Government intervention may not bring about an efficient allocation of resources, how far does this happen and under what conditions can we expect (if any) an efficient allocation of resource?

Essay Question 12
(Source: 2022 SAJC JC1 H2 FE)

There are big and small cinema operators in Singapore. Golden Village is the largest cinema chain with fourteen outlets, followed by Shaw Theatres with nine and Cathay Cineplexes having eight cinemas. There are only a few smaller operators such as Filmgarde with three cinemas. The growth of online on-demand streaming services such as Netflix with their wide variety of content at a relatively cheaper monthly subscription price as well as the manpower crunch have contributed to a decline in profits of cinema operators in Singapore.

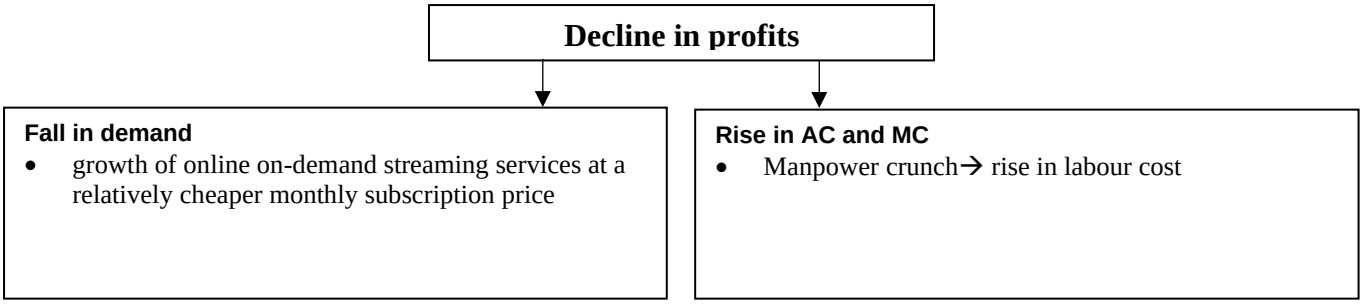
(a) Explain how the growth of online on-demand streaming services as well as the manpower crunch has contributed to a decline in profits of a cinema operator in Singapore. [10]

(b) Discuss whether it is always true that a cinema operator will seek to maximise profits. [15]

Question Analysis

Command Word	Explain how
Content Word	Each of above-mentioned events
Context	Decline in profits of a cinema operator in Singapore

Schematic Plan



Introduction
The decline in profits of a cinema operator in Singapore is due to the growth of substitutes such as on-demand streaming services and higher manpower costs arising from manpower crunch.

Body:
Requirement 1: Fall in Demand due to the growth of substitutes
Online on-demand streaming services can be considered as substitutes with positive XED value as they provide same movies as cinema at monthly subscription price. A decrease in price of such online streaming services caused demand for movie tickets to fall.
This results in fall in AR and MR of a profit maximizing cinema operator as shown in Figure 1 below. There is fall in both profit maximizing price from P_1 to P_2 and profit maximizing output from Q_1 to Q_2. Assuming no change in cost conditions, there is a fall in profits from supernormal profits at Q1 to normal profits at Q2.

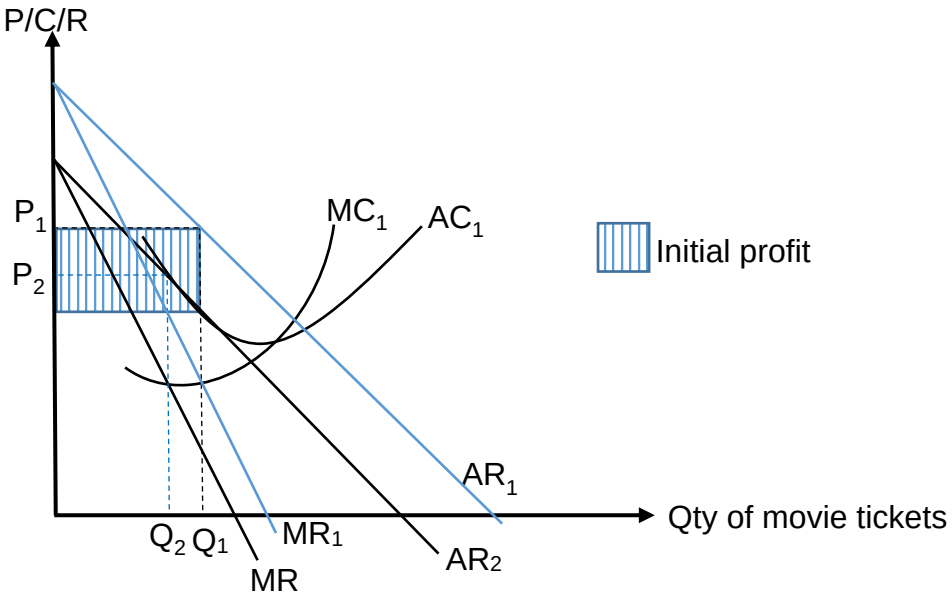


Figure 1: Fall in Demand for movie tickets

Requirement 2: Rise in AC and MC due to rise in wages

Manpower crunch implies that there is likely to be a shortage in the labour market resulting in a rise in wages. Wages represent variable cost of production because more labour is required when more output is produced and thus labour cost rises with output.

Rise in wages brings about in a rise in variable cost of production and hence leads to a rise in both MC and AC of a cinema operator.

MC and AC curves shift from MC_1 to MC_2 and from AC_1 to AC_2 respectively as shown in Figure 2.

Profit maximizing price rise from P_1 to P_2 while profit maximizing output falls from Q_1 to Q_2.

Assuming no change in revenue conditions, there is a fall in profits from supernormal profits at Q_1 to normal profits at Q_2.

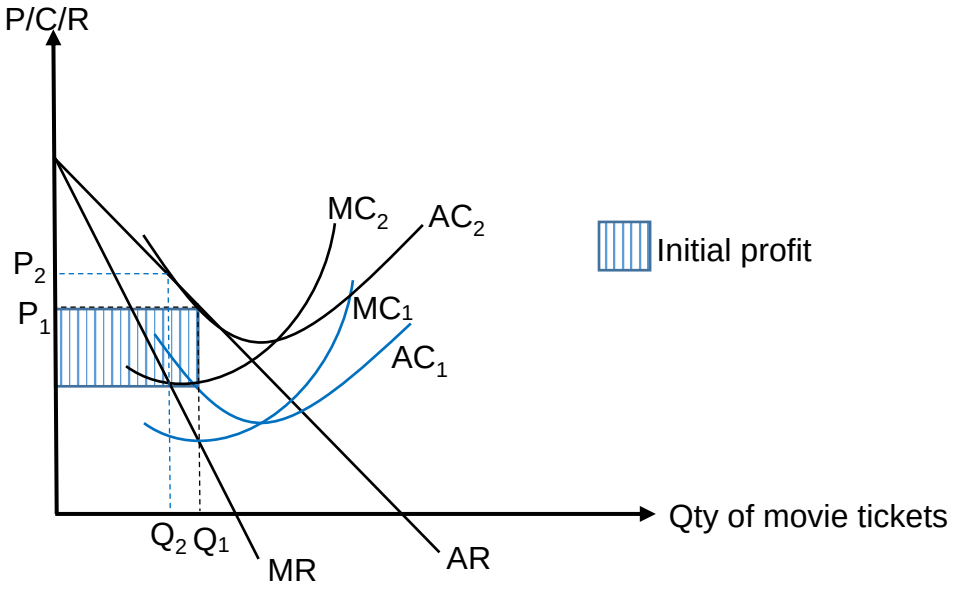


Figure 2: Rising MC and AC for a cinema operator

Conclusion:
Hence, the fall in demand arising from the growth of substitutes and rise in AC and MC due to the rise in wages has contributed to the decline in profits of a cinema operator in Singapore.

Level	Knowledge, Analysis, Understanding and Application	Marks
L3	Thorough knowledge of the facts and theory with an excellent ability to describe & explain in a precise, logical and reasoned manner. **Two requirements** of the questions on **(i) the fall in demand due to growth of online on-demand streaming services** and **(ii) the rise in AC and MC due to rise in labour costs** would lead to **fall in profits of a cinema operator in Singapore** have been addressed. This is done and supported by an **appropriate tool of analysis**. *For example, firms and decisions diagrams/analysis is well-presented and explained.*	8 – 10
L2	Accurate although undeveloped explanation of the **two requirements** of the questions - on **how the fall in demand and rise in AC and MC** would lead to **a fall in profits of a cinema operator in Singapore.** There should be evidence of an ability to identify facts, some ability in applying the **appropriate tool of analysis** in explanation. *For example, use of firms and decisions diagrams/analysis is evident though peppered with non-critical errors/omissions.*	5 – 7
L1	Answer shows some knowledge but does not indicate that the meaning of the question has been properly grasped. Basic errors of theory or an inadequate development of analysis may be evident. Where the answer is mostly irrelevant and only contain a few valid points made incidentally in an irrelevant context. *For example, answers explained how profits fell without applying revenue and cost based analysis.*	1 – 4

Examiners' Comments
Content:
A significant number of students applied demand and supply analysis instead of firms and decisions analysis as required by the question.

Many students were able to identify and explain cinemas and online streaming services to be substitutes with some scripts with good application of XED concepts. However, the quality of analysis in terms of how profits fell due to fall in AR and MR varies with some answers with good application via firms and decisions diagram and analysis while others made statement of TR fall and therefore profits fell without adequate explanation.

Analysis on manpower crunch was less well-done with a few errors:

- Many explained in terms of internal/external EOS being affected due to manpower crunch. This is inaccurate as manpower crunch is linked to price of labour rising not a change in scale of production.

- Some students explained that there is fall in productivity or productive efficiency. Manpower crunch has no direct effect on productivity or productive efficiency. The focus should be on the impact of manpower crunch on costs.

Skills:

Diagram drawing skills require improvement by many students

- small diagrams which make it difficult to see the shaded/indicated profit areas
- axes or curves not labelled or mislabeled
- free hand drawing instead of using a ruler
- Profit max price and output not indicated
- Price incorrectly read from MR instead of AR
- MC is drawn above AC for all outputs

Analysis/elaboration on manpower crunch was less well-done with many students not identifying and elaborating on the type of cost that rose i.e. variable costs when labour cost rose. While some students did show AC and MC changes in the diagrams, they did not clearly show the initial and new profit maximising price and quantity and did not use the diagram to show the initial and new profit areas accurately or not all.

Suggested Answer (b)

Question Analysis

Command	Discuss whether
Content	Always true Maximise profits
Context	Cinema operator

Schematic Plan

Thesis: Always true that a cinema operator will seek to maximise profits **Requirement 1:** Explain profit maximisation Explain one possible benefit of profit maximisation	**Anti- Thesis: Not always true that a cinema operator will seek to maximise profits** **Requirement 2:** Explain why a cinema operator will not be able to maximise profits due to insufficient information. Explain why a cinema operator will not be willing to maximise profits- one other objective **Other objectives**

Evaluation & Conclusion

Introduction:
Firms in the cinema industry are oligopolistic since there are only 3 dominant firms with large market share. A firm in the cinema industry may seek to maximise profits. However, in reality, a cinema operator may be unable or unwilling to maximise profits due to various reasons.

Body:
Requirement 1 (Thesis): A cinema operator may seek to maximise profits

Explain profit maximisation

- When revenue gained from the additional unit (MR) is greater than its marginal cost (MC), there is a net increase in profit from the provision and sale of that unit of movie ticket.
- This implies that the cinema operator can increase its profit by selling that unit of movie ticket.
- Thus, the cinema operator should increase the quantity of movie tickets to be sold.
- However, if the MR of the additional unit of movie ticket is less than its MC, then there is a net decrease in profit from the sale of that unit.
- So in order to maximise its profits, the cinema operator must reduce number of movie tickets sold.

- Hence the cinema operator will profit maximise at the output Q_e of movie tickets as shown in Figure 1 where MC=MR and MC is rising.

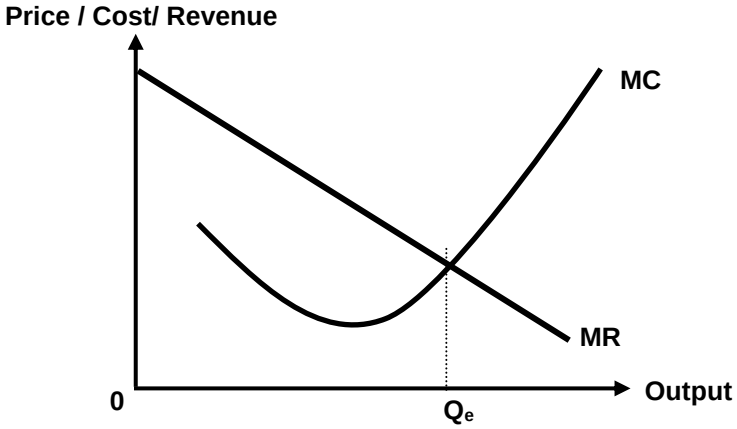


Figure 1: A cinema operator maximizing profits

Explain a possible reason for a cinema operator to maximise profits
A cinema operator e.g. Shaw Theatres may pursue profit maximization to withstand competition from other firms as there might be periodic price wars if rival firms such as Golden Village should engage in price competition by selling their movie tickets at discounted prices. Considering competition from online on-demand streaming services, a cinema operator may seek to maximise profits to have more resources for R&D.

Requirement 2

Anti-Thesis: A cinema operator will not seek to maximise profits

A cinema operator might not be able to maximise profits:

A cinema operator may lack sufficient accurate information on MR and MC and thus unable to maximise profits. For example, it might be difficult for the cinema operator to estimate implicit costs and thus only able to use explicit costs in estimating MC. Furthermore, it is difficult to predict demand and hence MR. In such situations, a cinema operator is likely to resort to simpler pricing models such as cost-plus pricing where the firm put a mark-up on top on the average cost of movie ticket and adjust the mark-up based on how well the movie tickets are selling.

A cinema operator might not be willing to maximise profits:

Revenue Maximisation

- Revenue maximisation is an alternative theory that assumes that the cinema operator aims to maximise total revenue instead of profit.
- This objective may be taken on by sales managers and commission-based employees whose income is dependent on the total revenue earned by the firm.
- As such, increasing the revenue of the cinema chain would result in higher personal incomes of the managers
- Revenue maximisation occurs at Q_R where total revenue is at the maximum or marginal revenue is equal to zero (MR=0).

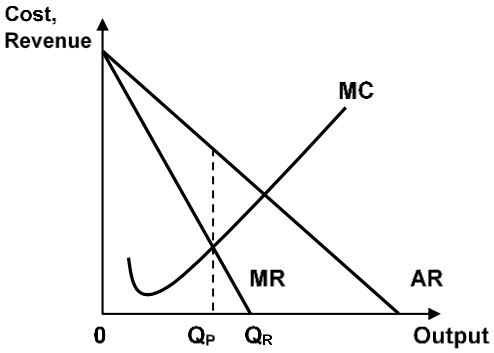


Figure 2: Revenue Maximisation

Profit Satisficing

- There is always a separation / divorce between ownership and management of a cinema chain such as Shaw theatres, whereby the owners / entrepreneurs of the firms may hire managers to run their companies. Firms that are run by managers (an employee of the firm) are likely to set prices that deviate from the profit maximising level. To ensure that they continue to be employed by the firm, the managers will likely aim to set at a price that is profit satisficing to please all stakeholders as far as possible.
- When a firm adopts a profit satisficing objective, it could produce within a range of output levels that achieves a given level of profit deemed acceptable by the shareholders rather than the profit maximising output.
- This objective may be adopted in cases where the cost of obtaining sufficient information to make profit-maximising decisions is significantly high, such as in cinema chains that have different range of movies screened or have many outlets located in different parts of Singapore.
- Avoiding the undue stress or perceived challenges of expansion could be another reason.

Market Share Dominance

- In order to increase its market share such that a cinema operator such as Golden Village could dominate the market, decisions could be made with the aim of driving rival cinema operators out of the market.
- One strategy that the firm could engage is predatory pricing, pricing movie tickets at a level where their competitors find it hard to compete with.
- Over time, rival firms such as Filmgarde may not be able to cope with the losses incurred due to matching the low prices set and choose to exit the market.
- The end result is that the cinema operator which engages in predatory pricing gains a larger market share and thus market power.
- The cinema operator would have incurred losses as well but have sufficient past profits or investment from shareholders to help them cope with the losses incurred.

Evaluation & Conclusion

Whether a cinema operator seeks to maximise profits or pursue other objectives depends on degree of information available on MR and MC, size of firms and degree of contestability:

Degree of information available to profit maximise:

It is likely that a cinema operator will not seek to maximise profits as the firm is not able to predict MR and MC as it is difficult to monetise implicit costs of running a cinema chain and costly to conduct research to estimate demand for each movie to be screened.

Size of firm:
There are both small and big firms in the cinema industries.
A larger cinema operator such as Golden Village run by managers may pursue revenue maximisation to increase chances of promotion of managers while a smaller cinema operator with limited demand may seek to pursue profit satisficing objective as managers may want to avoid stress of expansion.

Degree of contestability:
Rise in contestability in the cinema market due to advancement in technology with lower BTEs into the online streaming services has led to growth of such services, reducing demand for cinema operators. Larger cinema operators such as Golden Village may price closer to competitive levels and seek more efficient ways to operate cinema outlets to prevent potential threat of competition from turning into actual competition.

Level	Knowledge, Analysis, Understanding and Application	Marks
L3	Thorough knowledge of the facts and theory with an excellent ability to describe & explain in a precise, logical and reasoned manner. **Two requirements** of the questions on **(iii)** why firms may seek to maximise profits- **how firms profit maximise and one benefit of profit maximization** **(iv)** why firms may not seek to maximise profits **– why firms may not be able to maximise profits and why firms may pursue other objectives.** This is done and supported by an **appropriate tool of analysis**. Able to apply to the context of a cinema operator with appropriate examples.	8 – 10
L2	Accurate although undeveloped explanation of the **two requirements** of the questions. There should be evidence of an ability to explain why a cinema operator may and may not seek to maximise profits via use of **appropriate tool of analysis**. *For example, use of firms and decisions diagram/analysis is evident but contains non-critical errors/omissions.*	5 – 7
L1	Answer shows some knowledge but does not indicate that the meaning of the question has been properly grasped. Basic errors of theory or an inadequate development of analysis may be evident. Where the answer is mostly irrelevant and only contain a few valid points made incidentally in an irrelevant context. *For example, answers listed possible objectives briefly without application to the context and use of firms and decisions diagram/analysis.*	1 – 4
E3	Well explained evaluative judgments about 2 requirements + a summative conclusion	5
E2	Evaluative judgments about 2 requirements, one of which is well-explained	3 – 4

E1	Unsupported evaluative statements or one explained evaluative judgment	1 – 2

Examiners' Comments
Content:

Many students were able to state the profit max condition.
There are a few conceptual errors with regards to profit max condition:

- TR must be maximised, and TC must be minimised. This is not accurate. Profit is maximised when MR=MC and MC is rising
- Only supernormal profits can be earned when a firm adopts profit maximisation objective. This is not accurate. It is possible to earn normal, supernormal, or subnormal profits at the profit maximising output.

Some students were not able to clearly identify and explain alternative objectives. For example, predatory pricing (strategy) was explained without any clear link to the objective of market share dominance.

Skills:

Many students did not elaborate on how a particular output and price fulfil the profit maximisation condition. For example, explanation on how output less or more than profit max output is likely to lead to lower profits was missing or not adequately developed.
Some students explained strategies to increase profits instead of how profits gained via profit maximisation objective may benefit the cinema operator.

Many students did not consider whether a cinema operator is able to profit maximise and those who did usually when explaining profit satisficing objective did not adequately contextualise.

Many students were able to explain one or two alternative objectives, but they were not adequately applied to the cinema operator context.

Some students gave one-sided answer of either on profit maximization or alternative objectives and thus lacked sufficient balance in their answers.

For evaluation, some students gave a summary of points or made comments that were vague or not explained. These answers fared poorly.
A few scripts showed good evidence of considering the market structure, current competition or contestability to justify the choice of likely objectives but could have done better if whether a cinema operator is able to profit maximise had also been considered.

Essay Question 13
(Source: 2023 SAJC JC1 H2 FE)

1 Nickel is widely used in steel for construction and batteries for electric vehicles. Global nickel prices have fallen sharply amidst lower cost of mining and rising fears of an economic recession. A minimum price on nickel ore has been set in Indonesia in a bid to increase the revenue to its nickel miners. The Indonesian nickel miners are lobbying the government to seek new overseas markets to sell their nickel to.

(a) Using supply and demand analysis explain why lower cost of mining and rising fears of an economic recession may have led to a sharp fall in global nickel prices. [10]

(b) Discuss whether the use of minimum price on nickel ore is the best policy to increase the revenue of Indonesian nickel miners. [15]

Suggested Answers:

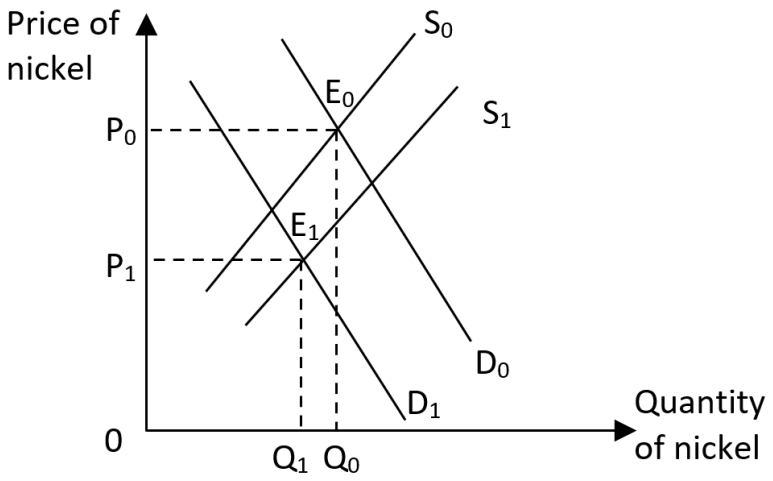
a) Using supply and demand analysis explain why lower cost of mining and rising fears of an economic recession may have led to a sharp fall in global nickel prices. [10]

Command	Explain
Content	Global nickel prices Use supply and demand analysis Sharp fall in price Elasticity analysis needed
Context	Global

Lower cost of mining
- Increase in supply due to lower unit cost of production (eg, technological improvements in mining processes)
- Quantity supplied increases at every price level, ceteris paribus

Rising fears of an economic recession
- Poor consumer expectations, lower purchasing power (eg, expect incomes/ wealth to fall in future, reduce current consumption)
- Fall in demand for construction (eg, new residential properties), electric vehicles
- Fall in derived demand for nickel (FOP - steel for construction, batteries for electric vehicles)
- Quantity demanded falls at every price level, ceteris paribus.

Surplus in global nickel market
- Increase in supply and fall in demand → surplus created at initial price level → downward pressure on price, leading to price adjustment process
- There is a downward pressure on prices as producers lower the price in order to clear their stocks. As the price decreases, consumers will increase their quantity demanded along D_1 and producers reduce their quantity supplied along S_1. This process of producer reducing their output and consumers increasing their quantity demanded will continue until the new market equilibrium is achieved with a new equilibrium price of P_1 and equilibrium quantity of Q_1.
- Diagram – well-labelled, well-referenced



YED Concept
- Large fall in derived demand for nickel
- Income elastic demand for construction, electric vehicles (assume normal goods, luxury big ticket items)
- Any fall in income brings about a more than proportionate fall in demand for construction, electric vehicles, ceteris paribus, creating a large surplus at the initial equilibrium price.

PED Concept
- Demand for nickel is price inelastic (FOP - widely used in steel for construction and batteries for electric vehicles)
- Any fall in price due to increase in supply will bring about a less than proportionate decrease in quantity demanded, ceteris paribus. To clear the surplus at the original equilibrium price, global nickel prices will fall sharply.

PES Concept
- Supply for nickel is price inelastic (eg, difficulty in varying output of mining machinery).
- Any fall in price due to decrease in demand will bring about a less than proportionate decrease in quantity supplied, ceteris paribus. To clear the surplus at the original equilibrium price, global nickel prices will fall sharply.

Conclusion
- The increase in global nickel supply coupled with price inelastic demand, as well as a large decrease in global nickel demand as a widely used FOP of construction, electric vehicles (normal goods with income elastic demand) and/or coupled with price inelastic supply, will cause a **large surplus** at original price level, hence exerting strong downward pressure on price, eventually leading to a sharp decrease in global nickel prices.

Level	Descriptors	Marks
L3	For a well-developed explanation, using supply and demand analysis and relevant examples, on how lower cost of mining and rising fears of an economic recession may have led to a surplus of nickel in the global market; and how global nickel prices may fall sharply using elasticity analysis and relevant examples. Price adjustment process is well explained and well-illustrated with supply and demand analysis.	8-10
L2	For an explanation, using supply and demand analysis and relevant examples, on how the changes in the supply and demand factors may have led to a surplus of nickel in the global market; and how global nickel prices may fall sharply using elasticity analysis and relevant examples. Price adjustment process is explained and illustrated with demand-supply analysis. However, responses contain some application to the given context and demonstrate use of demand-supply analysis with some errors.	5-7
L1	Descriptive responses, lack the use of supply and demand analysis, contain conceptual errors.	1-4

b) Discuss whether the use of minimum price on nickel ore is the best policy to increase the revenue of Indonesian nickel miners. [15]

Command	Discuss whether
Content	Minimum price on nickel ore Increase revenue of Indonesian nickel miners Best government policy
Context	Indonesia

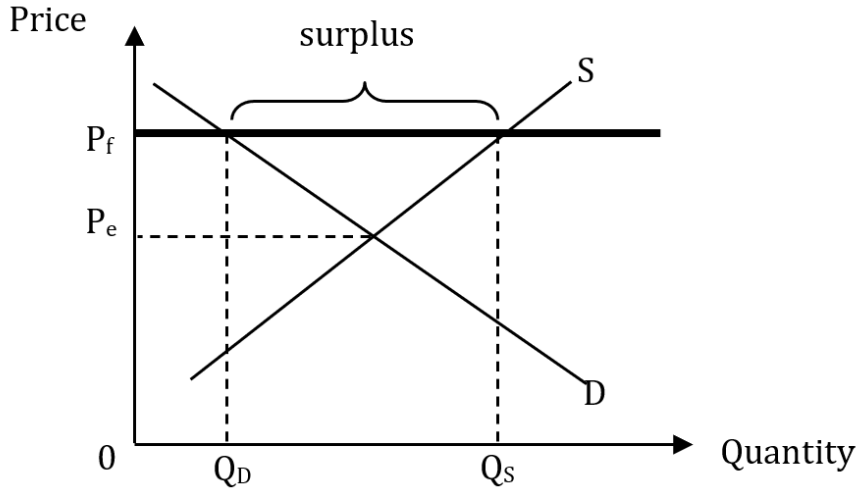
Introduction	
Thesis: Minimum price ceiling could be the best measure to increase the revenue of Indonesian nickel miners ➔ How it works ➔ Advantages	**Anti-thesis:** Minimum price may not be the best policy due to its ➔ limitations ➔ disadvantages Therefore, other measures should be considered: • Increase demand - seek new overseas markets to sell their nickel to. • Impose quota on nickel production • Reduce supply of nickel (stockpiling capability)
Evaluation	

Introduction

- The Indonesian government may deem the equilibrium price in the nickel market as too low. Undesirably low price for nickel may reduce the revenue of miners, perpetuating poverty.
- The government can increase the revenue of nickel miners through policies like minimum price, quotas or reducing the supply in the nickel market.

Minimum Price on Nickel Ore

- A minimum **price** is the lowest permissible price set by the government. The price is not allowed to fall below this level. The effective minimum price (P_f) is set **above** the equilibrium price (P_e).
- In the case of protecting producers' incomes, the impact will depend on the price elasticity of demand. Given an increase in price, and the demand for the good is price-inelastic based on analysis in Part (a), total revenue will rise.
- Takes effect immediately, certainty in outcome

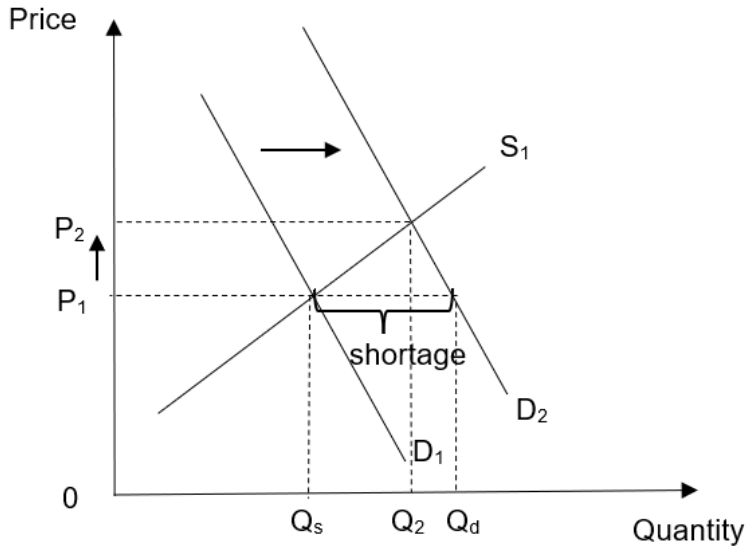


Disadvantages of Minimum Price:

- At the minimum price (P_f), the quantity demanded (Q_D) is less than the quantity supplied (Q_S). The imposition of the price floor results in a surplus of Q_DQ_S. The government needs to buy up the surplus in order for the nickel miners to benefit from an increase in revenue from the minimum price policy, putting a strain on government budget.
- To deal with the surplus, the government can buy the surplus and either:
  i) sell the good in the event of a future shortage, or
  ii) sell it abroad.
- Both instances require additional expenditure by the government (to purchase and store nickel) which would incur opportunity cost.
- Otherwise, only those who manage to sell their output at the minimum price would benefit from increase in revenue, those who cannot sell their output will be worse off.

Alternative policy: Increase in demand as Indonesia nickel miners lobby the government to seek new overseas markets to sell their nickel ore to.

- As a result of the higher demand, there will be a shortage of Q_sQ_d at the original equilibrium price, P_1, as quantity supplied (Q_s) is less than quantity demanded (Q_d). There is an upward pressure on prices as consumers compete for the good among themselves by bidding up the price. As the price increases, the quantity demanded decreases (movement upwards along demand curve). At the same time, producers will increase their quantity supplied (movement upwards along supply curve).
- This process of consumers bidding with higher prices and producers increasing their output will continue until the new market equilibrium is achieved at a new equilibrium price of P_2 and equilibrium quantity of Q_2. At this new market equilibrium, quantity demanded is equal to quantity supplied. This increase in demand will thus result in a higher equilibrium price and quantity at P_2 and Q_2 → increase revenue of nickel miners.



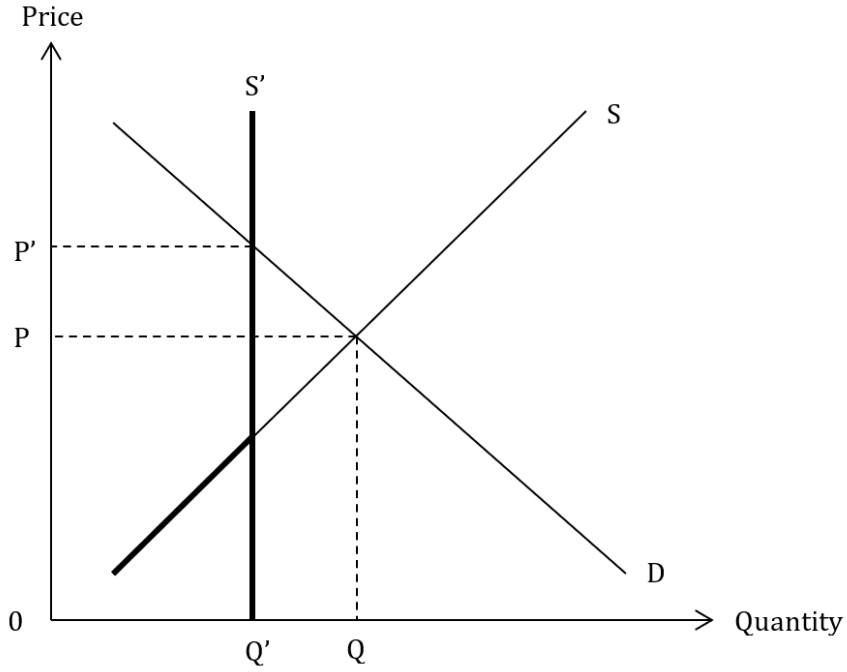
Limitations:

- Not immediate, uncertainty in success due to persistence of poor global economic conditions

Alternative policy: Impose Quota on production of nickel ore

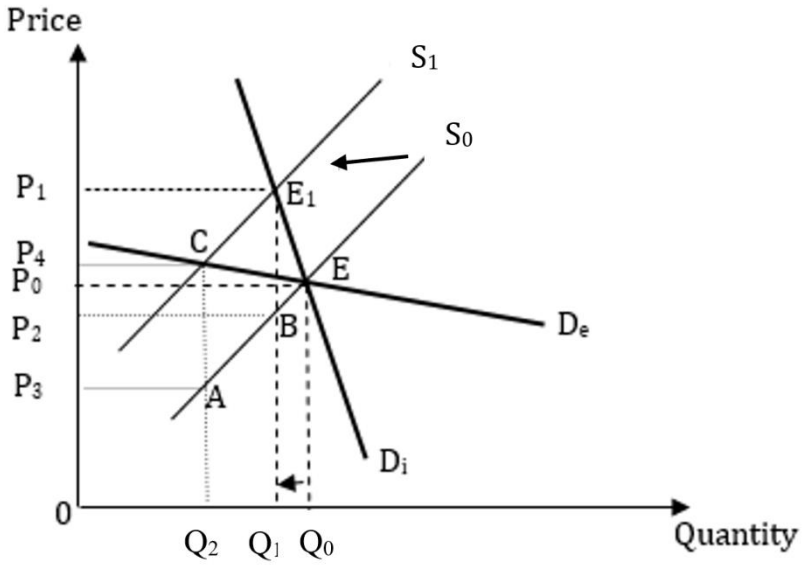
- When a quota is set by a government, a legal limit is fixed on the production of nickel **below its equilibrium quantity**.

- A quota is set at quantity Q', below the original equilibrium quantity, resulting in a vertical supply curve at the quantity of the quota (Q'). This means that the new supply curve is represented by the bolded line, S'.
- Given the interaction between the demand and the new supply curve, S', there will be a shortage at the initial equilibrium price P, leading to an upward pressure on prices. The new equilibrium price and quantity would be P' and Q' respectively. This means that for any quantity above that of the quota demanded by consumers, prices will just continue to rise as producers will not be able to further increase their quantity supplied.
- When a quota is imposed on the production of nickel, in the case of protecting producers' incomes, the impact will depend on the price elasticity of demand. Given an increase in price, and the demand for the good is price-inelastic (based on Part a analysis), total revenue will rise → increase in revenue due to an increase in price outweighs fall in revenue due to fall in quantity demanded.



<u>OR</u> Alternative policy: Reduce supply of nickel ore (<u>or</u> reduce the increase in supply of Nickel (smaller increase)

- With a reduction in supply, in the case of protecting producers' incomes, the impact will depend on the price elasticity of demand. Given an increase in price, and the demand for the good is price-inelastic (based on Part a analysis), total revenue will rise - increase in revenue due to an increase in price outweighs fall in revenue due to fall in quantity demanded.
- If nickel miners expect the price of nickel to change in the future, and have the option of stockpiling the good or service, they may adjust their supply in the current time period accordingly. If nickel prices are too low in the current period, and nickel miners expect nickel to be more expensive in the future, they may stockpile nickel for sale in the future because it will be more profitable to sell nickel in the future than in the current time period. Conversely, if nickel miners expect nickel to be cheaper in the future, they will release their stockpiles of nickel for sale in the current period, increasing current supply.


Price
S1
S0
P1
E1
C
P4
P0
E
De
P2
B
P3
A
Di
0
Q2
Q1
Q0
Quantity

Limitations

- Not all nickel miners have the capability to stockpile. When deciding to stockpile, one of the factors that producers consider is the cost of stockpiling as the high cost of stockpiling may outweigh the potential increase in revenue due to the higher expected prices.
- The nickel miners' ability to change their level of production is dependent on the availability of factors of production. Nickel miners are constrained in the short run as they face at least one fixed factor of production. A fixed factor of production is one whose quantity cannot readily be changed in a given time period. Examples include equipment and suitable factory space. For example, if there is a sudden increase in demand for nickel, producers may not be able to increase their quantity supplied of nickel much in the short run. This is because it can only change its variable factors (increasing working hours of labour) but not its fixed factors (installing more machinery) in the short run. Thus, supply tends to be price inelastic i.e., PES is less than one. This means that even if there is an increase in price, nickel miners cannot increase production fast enough to increase their quantity supplied more than proportionately. However, in the long run, nickel miners are not constrained by their fixed factors such as machinery as all factors are variable. Hence, they can respond well to the increase in price of nickel by increasing its quantity supplied. Supply can thus be price elastic in the long run i.e., PES is more than one.

Conclusion

- Stand on 'best policy' – agree or disagree with economic reasoning (eg, lack government resources to stockpile surplus nickel)
- Suggest combination of policies: SR – minimum price, LR – seek new markets as a more sustained solution to increase revenue of miners (can include diversification away from nickel mining to develop other sources of revenue).
- External factors: Improvement in global economic conditions, or increasing popularity of electric vehicles in the light of environmental concerns despite poor economic concerns – increase in derived demand for nickel → increase revenue of nickel miners.

Level	Descriptors	Marks
L3	For well-developed explanation, using demand and supply theory and examples, on the use of minimum price on nickel ore and at least one other relevant strategy to increase the revenue of Indonesian nickel miners. Response includes both explanation and limitations of the use of minimum price on nickel ore and at least one other relevant strategy.	8-10
L2	For an explanation, using demand and supply theory and examples, on the use of minimum price on nickel ore to increase the revenue of Indonesian nickel miners. Response may only focus on (i) the explanation and limitations of the use of minimum price on nickel ore, (ii) the explanation of the use of minimum price on nickel ore and one other relevant strategy, without limitations.	5-7
L1	For a largely irrelevant response or descriptive response with minimal application of demand and supply theory.	1-4
	Evaluation	
E3	Takes a clear overall stand that is justified by providing convincing evaluative comments on whether the use of minimum price on nickel ore is the best policy to increase the revenue of Indonesian nickel miners.	4-5
E2	Takes a clear overall stand which may be partially justified or unconvincing.	2-3
E1	Provides unsubstantiated opinion(s)	1

General Comments

While there were strong responses, the overall quality of responses was not as strong. The stronger responses to **part (a)** used correct and well-drawn diagrams to explain why lower cost of mining and rising fears of economic recession may have led a sharp fall in global nickel prices. These responses relied on sound economic concepts such as demand-supply determinants, elasticities of demand and supply, as well as the price mechanism. Weaker responses tend to omit the application of the elasticities of demand and supply. Responses to **part (b)** tend to be superficial. There were also many instances of inappropriate policies used to increase the revenue of Indonesian nickel miners.

a) Many students were able to draw well-labelled demand-supply diagram to illustrate how a fall in cost of mining and rising fears of an economic recession led to a fall in global nickel prices via the price adjustment process. Stronger responses further explained that the demand and supply of nickel were both price inelastic causing the *sharp* fall in global nickel prices. The sharp fall in price was also clearly shown on the diagram with steeper supply and demand curves. In contrast, mid to weak responses consisted of a correctly drawn diagram but simply stated that price had fallen without explaining why. There was no application of elasticities of demand and supply concepts.

b) While most students recognize that this part of the question has two requirements -1) how minimum price can increase nickel producers' revenue and 2) an alternative measure to increase revenue of nickel producers, the overall quality of responses showed 1) superficial understanding of minimum price and 2) lack of awareness of the context of the question.

Most students were able to explain what a minimum price is with a well-drawn diagram showing that an effective minimum price must be imposed above the equilibrium price. They were also able to cite limitations of imposing a minimum price such as the creation of surplus nickel. However, many students were not able to highlight the importance of price elasticity of demand being price inelastic, which would result in a rise in revenue collected by the nickel producers.

Students were not highly aware that the fall in the price of nickel resulting in a fall in revenue is the issue to be addressed here. An important assumption here is that nickel's demand must be price inelastic. Hence, inappropriate policies are recommended such as a subsidy to further reduce the equilibrium price of the nickel. A further reduction of nickel price given a price inelastic demand will cause nickel producers' revenue to fall further. Other inappropriate measure includes imposing a tax on producers. While a tax can increase the price of nickel, producers' revenue will be reduced due to the payment of taxation to the government. This is unlikely going to increase the revenue of nickel producers. The most straightforward way to increase revenue is to increase demand for nickel. This will increase both the equilibrium price and quantity of nickel, which in turn increases the revenue.

Essay Question 14
(Source: 2023 SAJC JC1 H2 FE)

Open defecation instead of using proper sanitation facilities is one of the most complex social and health challenges that India faces. Despite serious health repercussions there are approximately 525 million people in India who are still defecating in the open, the majority of whom are living in rural areas. Public education forms the most common way of promoting proper sanitation use in India to combat cultural beliefs.

Adapted from Lee Kuan Yew School of Public Policy, 13 Apr 2020

(a) Explain any two reasons for government intervention in the usage of proper sanitation facilities in India [10]

(b) Discuss whether public education is the best policy in addressing the sanitation issues in India. [15]

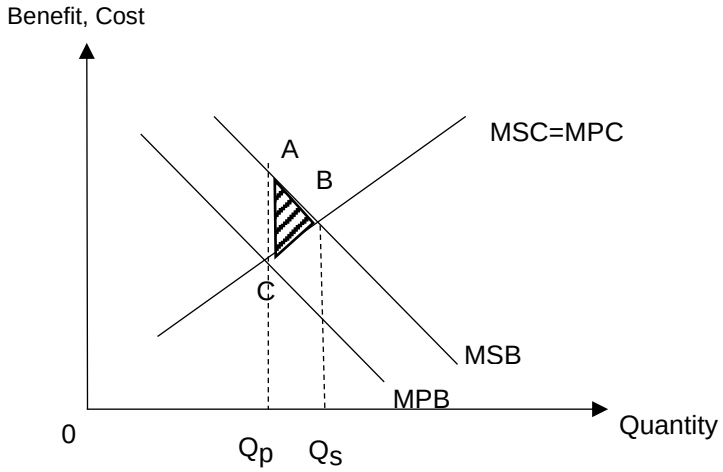
Part (a)
Introduction
The two reasons for government intervention are (any 2 below)

1. Positive externalities in consumption
2. Presence of imperfect information
3. There are also equity issues where the free market distributes the facility only to those who can afford the facility resulting in an exclusion of those who can't afford to pay. [can accept if students write on this]

Positive Externalities

- Positive externalities are benefits to third parties not involved in the consumption of the sanitation facilities.
- A consumer will only consider his own private costs such as the cost of the sanitation facility to himself, construction cost of a private toilet, maintenance cost in keeping it clean and private benefits such as having a cleaner environment to defecate, reduced risk in getting affected by diseases in his/her decision-making.
- A consumer does not take into account the positive externalities on others that would be generated by him using proper sanitation facilities. The community/people living near his house will enjoy external benefits in the form of a cleaner environment and reduced spread of diarrheal diseases such as cholera, leading to lower death rates and healthcare costs. India's economy will also benefit from a healthier workforce and a lower burden on its healthcare facility. [accept any reasonable external benefits]
- Due to the presence of positive externalities in the consumption of sanitation facilities, there would be a divergence between Marginal Social Benefit (MSB) and Marginal Private Benefit (MPB) as shown in the diagram below.
- Motivated by self-interest, consumers will maximise utility by consuming at a level 0Qp where MPB=MPC.
- However, to maximise society's welfare, society desires that sanitation facilities be consumed at the socially optimum level of output i.e., 0Qs where MSB=MSB.
- Since the socially optimum level of output i.e., 0Qs is greater than the actual output consumed i.e. 0Qp, there is under consumption of sanitation facilities. This implies that there is under-allocation of resources in the consumption of sanitation facilities.

- The quantity under consumed (QsQp) generated loss of additional social benefit of QpABQs but a saving of additional of social cost of only QpCBQs, resulting in a DWL of ABC for the society. Hence, there is allocative inefficiency and society's welfare is not maximized.
- Thus, government will want to intervene in the market to increase the consumption of sanitation facilities to increase society's welfare.

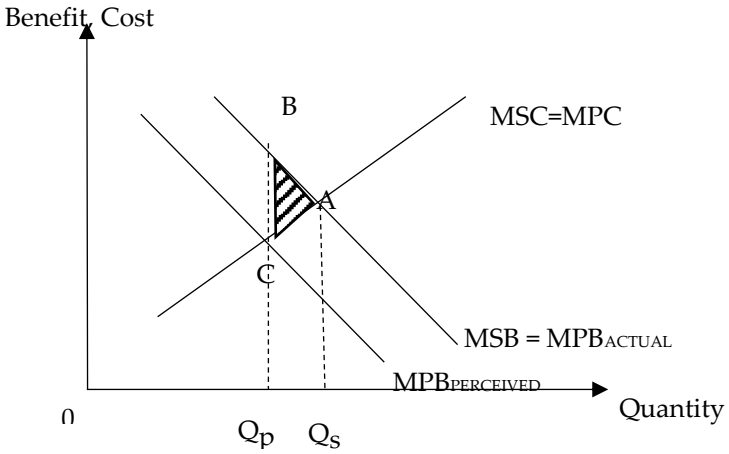


Imperfect information

If left to the free market, it is likely that sanitation facilities will be under-consumed because individuals undervalue their private benefits of using private toilets and sanitation facilities. Individuals may not act in their best interests due to the lack of information about the full benefits of consuming the good. Due to cultural norms and beliefs, particularly in the rural areas, open defecation is seen as a customary practice and a way of life.

- Marginal private benefits perceived by individuals is lower than the actual MPB as many people in the rural areas are not aware about the full private benefits of consuming sanitation facilities. They did not know that using sanitation facilities could reduce the spread of diseases to themselves and their households, reducing medical costs in the long run. OR they did not realise that the use of sanitation facilities will provide more opportunities for education and work for themselves. [Accept any reasonable examples of how private benefits is undervalued]

- Assuming there are no externalities, MSB=actual MPB and MSC=MPC,
- Due to imperfect information, consumers will consume at the output Qp where perceived MPB=MPC. However, society's welfare is only maximised at the socially optimum level of output i.e., 0Qs where MSB=MSC.
- Since the socially optimum level of output i.e., 0Qs is greater than the amount consumed 0Qp, there is under consumption of sanitation facilities. This implies that there is under-allocation of resources in the consumption of sanitation facilities.
- The quantity under consumed (QsQp) generated loss of additional social benefit of QpBAQs but a saving of additional of social cost of only QpCAQs, resulting in a DWL of ABC for the society. Hence, there is allocative inefficiency and society's welfare is not maximized
- Thus, government will want to intervene in the market to increase the consumption of sanitation facilities to increase society's welfare.



Inequity

- Due to income inequality, some people will have insufficient dollar votes. Their preference for the good is not considered by the free market.
- If left to the free market, there will be a lack of effective demand since lower-income groups are unable to afford sanitation in the free market in absence of dollar votes. This is particularly true in India where a sizeable number of people who live below the poverty line lack the ability to purchase and construct a private sanitation facility in the free market.
- The free market will allocate resources based on the dollar votes, where DD = SS and produce and consumer at Qe units of output. However, consumers who lack the willingness and ability to afford sanitation facilities will be priced out of the market due to lack of effective demand at the prevailing market equilibrium price due to the lack of dollar votes.
- Therefore, it is an economic case for government intervention if government believe that consumption should not be based solely on the grounds of ability to pay for such an essential facility.

Marking Scheme

Level	Knowledge, Application, Understanding and Analysis
L3 **8 – 10**	For an answer that has • Provided a well-explained analysis of **any two** reasons for government intervention in the market for sanitation facilities. o Positive externalities in consumption o Presence of imperfect information o Inequity • Diagrams are well-explained and correctly drawn.
L2 **5 – 7**	For an answer that has the following: • Provided a well-explained analysis of **only one** reason for government intervention in the market for sanitation facilities. OR • Underdeveloped analysis of two reasons
L1 **1 – 4**	For an answer that has the following: • Conceptual errors • Irrelevant or inaccurate analysis of the question and/or context such as identifying negative externalities instead of positive externalities.

Markers' Comments

Part (a)

a. general comments (i.e., how the cohort faired (the CAIE type)

This was the most popular question for Paper 2. Responses were generally weak as many did not interpret the context correctly.

2. question analysis à how students should be interpreting the question versus what they did

There was large variation in the quality of responses to this question.
The main discriminating factor was the ability to identify the correct market and provide an analytical explanation to why sanitation facilities is under-consumed in the free market as there is presence of information failure and positive externalities in consumption.

Stronger answers gave a clear and well-explained application of positive externalities and presence of information failure applied to sanitation facilities.

Weaker responses mistook open defecation as the context to analyse instead of seeing it as an outcome of under-consuming proper sanitation. A market involves buyers and sellers in the exchange of a good or service and therefore the act of open defecation is not a market.

A handful of students did not recognize that the reasons for why government intervene is due to either allocative inefficiency (as a result of sources of market failure) and/or inequitable distribution of income. Weaker responses will provide descriptive answers such as importance of cleaning the environment and attracting tourism.

a. content issues à do not just state what is wrong but focus on what is the correct understanding

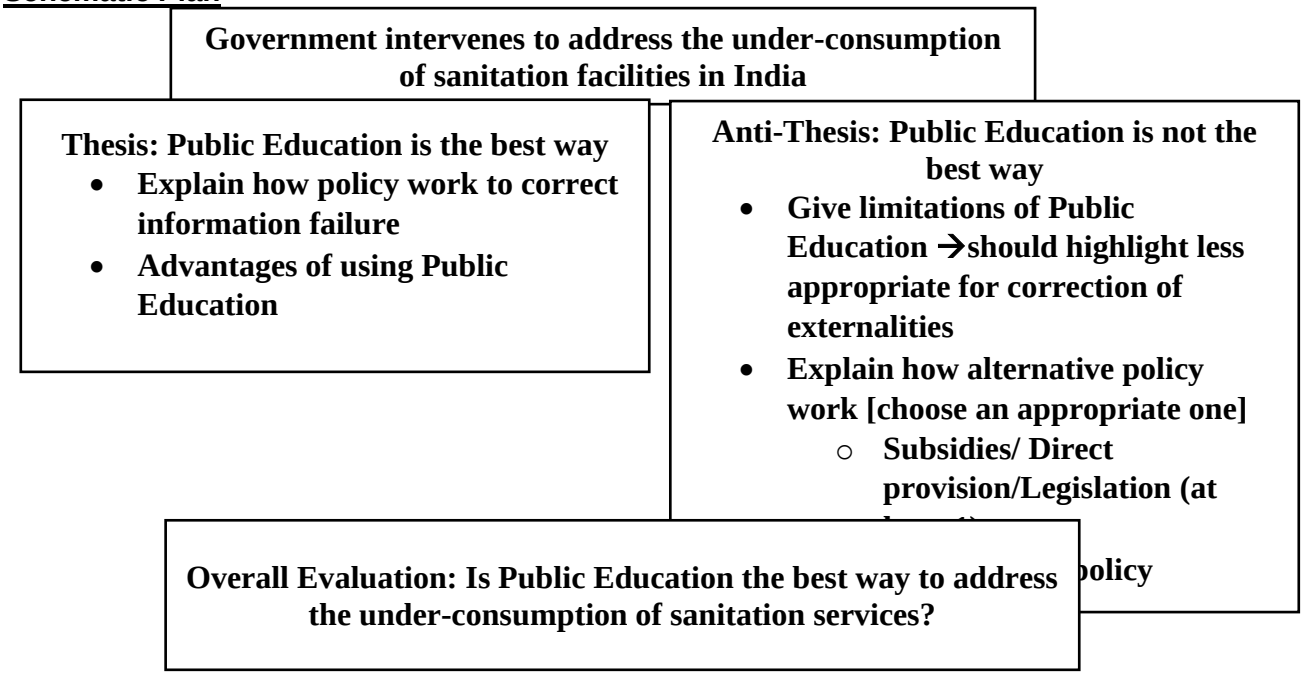
Stronger responses made use of diagrams to analytically explain market failure due to positive externalities and information failure.

Correct explanation of how deadweight loss is derived is "for the amount under-consumed, additional social benefit (e.g. Area QpABQs) outweighs the additional social cost (e.g. Area QpCBQs), leading to a deadweight loss of area ABC. Many students did not specify it is referring to the amount under consumed. Do note that additional benefit/cost is not the same as total benefit/cost.

b. phrasing à potentially may overlap with the previous point but this looks at specific phrasing issues, e.g., the good is price elastic should be demand for the good is price elastic.

Part (b)
Discuss whether public education is the best policy in addressing the sanitation issues in India. [15]

Schematic Plan



Introduction
State the objectives of the government, considering the market failures stated in part (a).
Government aims to use policies to increase consumption of sanitation facilities. Policies are targeted to.

i) reduce the imperfect information on the use of sanitation facilities
ii) allow consumers to internalize external benefits so that the socially optimal level of consumption can be achieved.
iii) improve equity

Thesis:
Explain how public education works to increase the consumption of sanitation facilities in India.

- Governments can undertake campaigns or public awareness programmes to highlight the private benefits of using proper sanitation facilities. Consumers can be educated on how diseases are spread through open defecation and how risk is reduced when private toilets are used. Proper sanitation facilities allow consumers to clean their hands and reduce the risk of contamination. This will increase consumers' perceived MPB to the actual/true MPB. Consumers will now consume at Qp' where actual MPB=MPC. This is also the social optimal output Qs where MSB=MSC thus eliminating the deadweight loss and achieving allocative efficiency.

Advantages of public education

- Campaigns/education to overcome information failure may be more effective in the long run as it a change in mind-set/ habits allow a more permanent effect on behaviour and thus addresses the root cause of the problem.

Anti-thesis 1: There are limitations to Public Education in correcting the market failure
Disadvantages of public education

- There is no guarantee that public education will have the intended effect of changing consumers behaviour as mindsets are hard to change. This is particularly more difficult in the rural areas in India where there is low literacy and educational attainment, and people are less receptive to new information. As such, these campaigns may be largely ineffective in increasing consumption for proper sanitation facilities.
- It takes a long time to change the mindset of people against their previously held beliefs about open defecation. It is also difficult to gauge the success of the campaigns. A short-term policy may be required to see more immediate results.

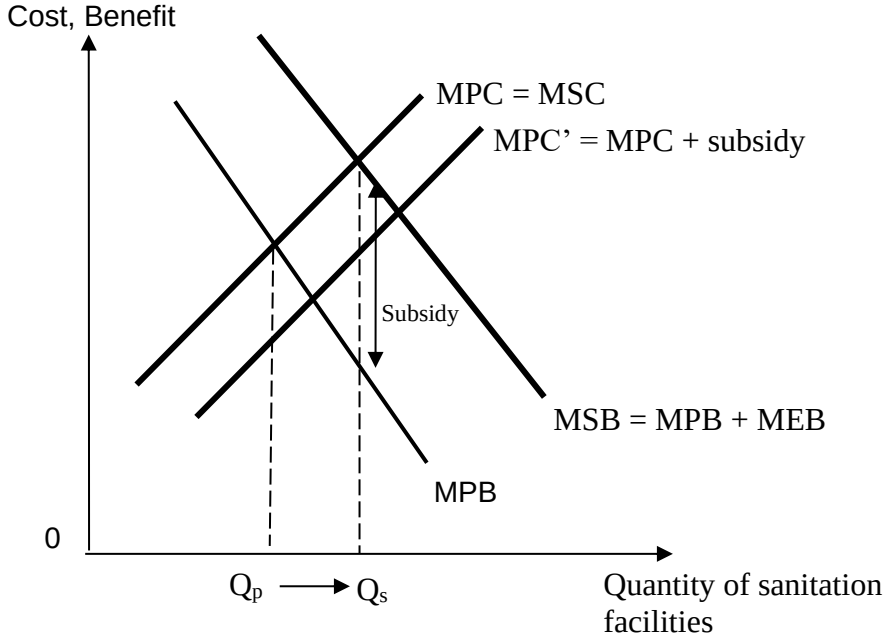
Therefore other policies are needed to complement the use of public education.

Anti-thesis 2: Choice of subsidy, government provision, or legislation

Explain how the government can address the underconsumption of sanitation facilities through subsidies

Subsidy

- **Government can either 1) provide subsidy directly to consumers to lower their private cost of consumption of sanitation facilities, or 2) to the producers to lower the cost of production of sanitation facilities.**
- In the case where subsidies are given to producers, assuming that producers pass down the cost savings to the consumers in the form of lower price of sanitation facilities. This would in turn reduce consumers' private cost of consumption of sanitation facilities too.
- This would lead to **consumers' Marginal Private Cost (MPC) of sanitation facilities to be lowered.**
- With reference to the diagram, assume that the fall in price of the sanitation facilities is equal to the amount of Marginal External Benefit (MEB) at Qs. Hence, the MPC curve will shift vertically downwards by the full amount of the subsidy from MPC to MPC' i.e., MPC + subsidy.
- Consumers will now maximise their utility and consume at Qs level of sanitation facilities where MPC' = MPB. Qs is also the socially optimal level of output being achieved where MSC = MSB. The level of sanitation facilities will increase from Qp to Qs. The welfare loss to society would be eliminated.



- In the case where subsidy per unit of sanitation facilities is given directly to consumers,
- The government can grant a subsidy per unit of education (to consumers) to internalise the external benefit. The size of the subsidy should be ideally equivalent to the extent of marginal external benefit (MEB) at the socially optimal output (Qs) so as to completely eliminate the welfare loss.
- Subsidy encourages the consumer to take into account (internalise) the external benefits, raising the MPB to MPB' to be at the same level as the MSB.
- Faced with the new MPB, the consumer will now base decision on MPB(new)=MPC and increase consumption to Qs, which is the socially efficient level. The welfare loss to society would be eliminated.

Advantages of subsidy

- Such a subsidy creates an incentive to consume more sanitation facilities and it is easily implemented to bring about increased consumption. Subsidy also makes sanitation facilities become more affordable to all; this would also improve equity as lower income groups get to enjoy essential goods.

Disadvantages of subsidy

- The limitation of using this method is that a government may suffer from imperfect information. Government may not know the exact amount of the MEB at the socially optimum level of output as it is difficult to put a monetary value on intangible external benefits such as the reduced risk of contracting malaria.
    - An over-estimation of the amount of external benefit would translate into a subsidy that may give rise to over-allocation of resources. An under-estimation will not be sufficient to increase consumption of sanitation facilities to the socially desired level.
- Subsidies will always take a toll on government budget. Opportunity cost can be in the form of more education facilities if building more schools is the next best alternative.

OR Explain how the government can address the underconsumption of sanitation facilities through direct provision.

Direct Provision

- The India government can directly provide sanitation facilities. This can be done in the form of constructing private toilets in households and operating a sanitation facility to manage waste to support the use of toilets.
- If the government provides free provision of the sanitation facilities and assuming the only private cost faced by the consumer is the building of the facilities, MPC will fall to MPC'=0. Consumers will now base their consumption at MPB= MPC' and thus consumption will increase to nearer or at the social optimal output OR
- If the government provides free provision of the sanitation facilities and assuming there are still some private costs in the form of inconvenience in going to the toilets or maintenance cost, MPC will fall to MPC'. Consumers will now base their consumption at MPB= MPC' and thus consumption will increase to nearer or at the social optimal output.

Advantages of direct provision

- Even though private sector can provide the good, economic rationale for government provision of essential goods is that as government-owned non-profit organizations, the firms will not exploit their market power. This enhances allocative efficiency. Their

cheaper prices will enable the low income to afford the facility, hence increasing the consumption of sanitation facilities as well as ensuring the quality of sanitation facilities provided.
- Presence of government provision also provide a check for private producers to stay competitive in terms of quality and cost. It increases the supply of sanitation facilities ensure price affordability (subsidies can be used to further improve the equity issues)

Limitations of direct provision
- According to the preamble, construction and use of improved sanitation facilities have lagged and thus affected the ability of consumers to switch to the use of proper sanitation facilities.
- The lack of profit motive by government-owned institutions could mean a lack of incentive to keep costs low, and to improve on its quality of facility, since government-owned institutions know that losses are borne by taxpayers. Hence, it is important to consider the possibility of government failure which will lead to greater allocative inefficiency.
- The lack of technological know-how by the government may pose challenges in ensuring a comprehensive sanitation facility is smoothly operated.
- The cost of direct provision of sanitation facilities requires huge and sustained funding which will again take a toll on government budget and divert government resources away from other projects such as infrastructure development or healthcare.

OR
Explain how the government can address the underconsumption of sanitation facilities through legislation

<u>Legislation (Compulsory sanitation facilities)-not very appropriate</u>
- Government can also ban open defecation and force its people to use proper sanitation facility. People caught in the act can be fined or arrested. [students should specify an appropriate example of the legislation]
- Economic analysis: This raises the incentives to use proper sanitation facility thus it raises consumers' MPB to MPB'.
- Faced with the new MPB, the consumer will now base decision on MPB(new)=MPC and increase consumption to Qp' which is closer to Qs, the socially efficient level. The welfare loss to society is reduced. [student can draw an appropriate diagram]

Advantages of Legislation
- Easy to implement.

Disadvantages of Legislation
- Most of the rural areas in India does not have a proper sanitation facility hence people do not have an alternative but continue to open defecate.
- Many low-income residents do not have the means to install their own sanitation facilities.
- The implementation of this policy requires heavy manpower for monitoring thus incurring substantial monitoring cost. This may lead to poor compliance if it is not well-enforced thus lacking effectiveness.

Conclusion - whether public education is the best way (most effective) to encourage the consumption of sanitation facilities?
Judgment: Public Education alone cannot achieve economic efficiency in the market, it needs to be used together with subsidies/direct provision/legislation as there are two sources of market failures

Substantiation: There are two market failures as mentioned above. Subsidies which provide an incentive to consumers allow them to internalize the external benefits and increase consumption. Public education reduces the information gap and address it directly. Therefore, a combination of policies will help address the two root causes of the market failure [Root cause]. Furthermore, the use of subsidies also helped to improve equity which allows the low-income groups in India to have access to the sanitation facilities.
Judgment: Public Education should be complemented with other policies to better achieve allocative efficiency
Substantiation: While public education is able to challenge current mindset, the provision of the sanitation facilities is also a key issue in rural India. It is thus better to complement public education with subsidies and direct provision to address positive externalities and equity issues in the market. [considering nature of the economy]
Substantiation: While public education is able to challenge current mindset, it takes a long time to show effect. In the short term, it might be necessary for government to use subsidies and direct provision to increase the consumption of sanitation facilities to prevent the severe health repercussions from worsening.
Summative conclusion: In consideration of India's rural environment with insufficient public sanitation facilities, poor literacy rates and where monitoring efforts are hampered by lack of manpower, the government should consider the use of both direct provision and public education to improve the consumption of sanitation facilities in India.

Marking Scheme

Level	Knowledge, Application, Understanding and Analysis
L3 **8 – 10**	For an answer that has • Provided a developed analysis of public education and at least one other appropriate policy addressing two reasons associated with the under-consumption of sanitation facilities. • Well-contextualised assessment of its advantages and limitations
L2 **5 – 7**	For an answer that has the following: • Provided a developed analysis of public education OR one other appropriate policy associated with the under-consumption of sanitation facilities. • Underdeveloped assessment of its advantages and limitations OR • Some explanation of at least 2 policies but lack rigour or inconsistent application of economic concepts.
L1 **1 – 4**	For an answer that has the following: • Lack economic analysis in how policies corrected positive externalities and/or imperfect information or equity issue. • Largely descriptive rather than analytical • Inappropriate choice of the alternative policy such as taxes
E3 **4 - 5**	Well explained evaluative judgments about 2 requirements + a summative conclusion
E2 **2 – 3**	Evaluative judgments about 2 requirements, one of which is well-explained
E1 **1**	Unsupported evaluative statements or one explained evaluative judgment

Markers' Comments

Part b)

a) general comments (i.e., how the cohort faired (the CAIE type)

There were only a few good responses to this question.

b) question analysis à how students should be interpreting the question versus what they did

The stronger responses use correct and well-drawn diagram to explain how public education correct the under consumption in the market for sanitation facilities. These responses used a well-drawn marginal social benefit / marginal social cost / marginal private cost / marginal private benefit (MSB/MSC/MPC/MPB) diagram to explain how public education works to increase consumption of sanitation facilities as well as an alternative policy which is better or complement the use of public education especially in its role in helping consumers internalise external benefits.

Most responses understood the question but explanation of the use of public education and a self-recommended alternative policy is poorly applied, largely due to poor understanding of the given context. Weaker responses gave a range of inappropriate policies including a use of subsidies and quota on open defecation without recognising that this is not possible and accompanying explanations lacked focus on the context of the question. They also made poor or no use of diagrams, other supporting economic concepts, or tools of analysis.

c) content issues à do not just state what is wrong but focus on what is the correct understanding

An analytical explanation of how the policy (public education and an alternative policy) corrects the market is required. A brief description of the policy is needed and answers should show how the policy adjusted MPB/MPC/MEB/ perceived MPB/actual MPB and how the new private output is increased to the social optimal output with the aid of a diagram.

The evaluative judgements considered whether public education is the best policy or the use of public education should be complemented with other policies under the sanitation context in India. Midrange responses focused comparison on the cost of implementing the policy to justify which is most appropriate strategy. Stronger responses recognised the unique issues faced by India's rural areas such as many in poverty and are illiterate to consider the best short-term and long-term approach in solving the issues.

d) phrasing à potentially may overlap with the previous point but this looks at specific phrasing issues, e.g., the good is price elastic should be demand for the good is price elastic.

Essay Question 15
(Source: 2023 SAJC JC1 H2 FE)

3 Firms that are perceived to focus solely on profit maximisation risk damaging their brand image. Consumers today seek to purchase from firms that provide them with personalised shopping experiences to shop with ease and provide products that considers the social and environmental impact.

(a) Explain why firms may choose to set price and output at the profit maximising point and one other reason why they may not. [10]

(b) Discuss the strategies that firms can use to increase profits in the light of changing consumer mindsets. [15]

(a)

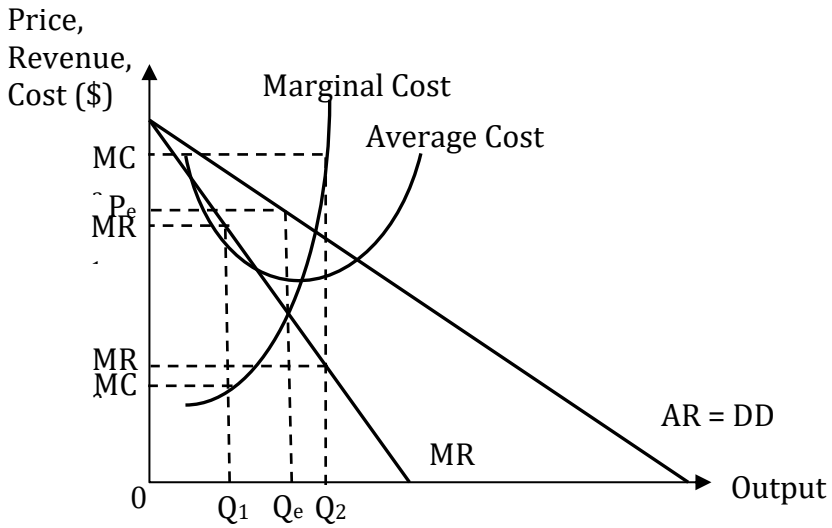
Question analysis:
Command word: explain why → reasons
Concepts: profit maximising price and output condition; alternative objectives of firms
Context: open

Question requirements:
R1: explaining how setting price at profit maximising point is rational
R2: explain how firms may choose other objectives beyond profit maximising

Suggested answers:

Introduction:
The traditional objective of firms is to profit maximise. Profit is the difference between total revenue received from sale of goods and total costs of production of those goods. Firms will choose to set their price and output at the profit maximising point as this allows them to attain the highest amount of profit possible. However, in reality, due to the difficulties of setting price and output at profit maximising point or because firms have alternative objectives, they may not choose to set it at profit maximising point.

Body:
R1: Why firms choose to set price and output at profit maximising point
Firms make use of the marginalist approach to set price and output at the profit maximising point to enable them to earn the most profits. Firms will choose to set their price and output where MR=MC, where MC is rising.



With reference to the figure above, if firms choose to produce $0Q_1$ level of output, the firm's marginal revenue (MR_1) is greater than its marginal cost (MC_1). This means that an additional unit of output allows the firm to add more to its total revenue than it costs the firm to produce the additional unit of output. In other words, the addition to the firm's total revenue by selling one more unit exceeds the addition to the firm's total cost by producing that one more unit. Thus, it will benefit the firm to increase its output from $0Q_1$ to $0Q_e$ as the sale of each additional unit from $0Q_1$ to $0Q_e$ adds to the firm's total profits.

In contrast, if the firm were to choose to produce $0Q_2$ level of output, the firm's marginal revenue (MR2) is less than its marginal cost (MC_2). This means that the additional unit of output incurs more cost that the revenue enjoyed by the firm. In other words, the addition to total cost (MC) from the production of an additional unit beyond $0Q_e$ is greater than the additional revenue (MR) from the sale of that unit. It will benefit the firm to reduce its output as the production of those units more than $0Q_e$, adds more to total costs that it does to total revenue. This causes the firm's total profit to fall. Hence, the firm will cut back on production till it produces output of $0Q_e$.

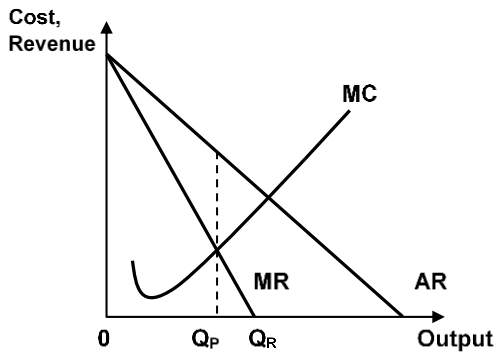
From the above, we can see that in order to maximise its profits, a firm will increase its production of the good when MR > MC, and will reduce its production of the good when MR < MC, until the point where MR=MC.

<u>R2: Firms may choose to pursue other objectives</u>

However, in reality, firms may face difficulties in trying to determine their actual MR and MC or may simply choose to pursue other objectives as the owners of the firms are different from the ones managing the firm. Hence there is a mismatch between the objectives of the two.

Revenue maximisation
Firms may choose to maximise revenue rather than profits especially in large companies where decisions are made by managers rather than the owners and sales revenue is often used to judge the success of the managers. This means that output will increase as production is set at MR = 0 and profits will be lower.

When a firm chooses to maximise revenue, the firm will produce at the output level where marginal revenue is zero (MR=0) which is QR in the figure below.



If the firm chooses to maximise profits, the firm will produce at the output where marginal revenue equals to marginal cost (MR=MC), the profit maximisation output will be at QP shown in the figure above. Comparing the two different objectives, the revenue-maximising output of QR tend to be higher than the profit-maximising output of QP.

Profit-Satisficing Behaviour
Some firms operate in a highly complex industry where it is difficult to estimate the true costs of production and the market demand thus the firm may set a profit target that is both satisfactory and achievable. As information is imperfect, owners may not know what the maximum level of profits could be. Hence managers may aim for a level of profits that is just enough to satisfy the owners rather than maximise profits. This means that the level of profits may be lower compared to the traditional objective. This is especially so when there is separation of ownership and management.

This objective may be adopted in cases where the cost of obtaining sufficient information to make profit-maximising decisions is significantly high, such as in firms that have multiple product offerings or have many plants located in different countries.

Market Share Dominance
Some firms may operate in highly competitive industries and these firms may be willing to forgo short-run profits to increase its market share instead. One strategy that the firm could engage is predatory pricing. Predatory pricing is a deliberate strategy of driving competitors out of the market by setting very low prices or selling below average variable cost (AVC). Over time, rival firms may not be able to cope with the losses incurred by matching the low prices set and choose to exit the market. The end result is that the firm which engages in predatory pricing gains a larger market share and thus market power. The firm would have incurred losses as well but have sufficient past profits or investment from shareholders to help them cope with the losses incurred. Once rival firms have been driven out and entry of new firms deterred it can raise price. This will see its profits reduced compared to the traditional objective of profit maximisation.

Social Objectives
Firms which take on such an objective are more likely to engage in production/provision of goods and services to promote social welfare. These firms may choose to employ more environmentally friendly techniques or materials in production or choose to produce healthier alternatives of their products.

Additionally, firms may consider the impact of their goods and production processes on society and the environment and hence use less harmful inputs or production methods. For example, food manufacturers may use healthier ingredients like unsaturated oils to cook their products or bio-degradable packaging like paper rather than non-biodegradable ones made from plastics to pack and store their products. While critics may consider such actions to be merely

responses that cater to the demand of increasingly health and environmentally conscious consumers, it is possible that the managers or owners of some of these firms could be undertaking such decisions at the expense of profits as they have altruistic intentions.

Level	Descriptors	Marks
L3	For a well-developed explanation, using MR and MC analysis on why firms would choose to set price and output at profit maximising price and output. AND For a well-developed explanation of any alternative objective that firms may have.	8-10
L2	For an explanation, using MR and MC analysis on why firms would choose to set price and output at profit maximising price and output. AND For an explanation of any alternative objective that firms may have. However, there may be some gaps in analysis.	5-7
L1	Descriptive responses, that lack the use of MR and MC model and contains conceptual errors.	1-4

Examiners' Comments:

General Comments:
This part of the question was poorly attempted by candidates and showed major conceptual misunderstandings held by candidates. This part of the question required candidates to explain **why** firms set prices and output **at the** profit maximising point and was not about why firms would want to earn profits.

Conceptual errors:
- Setting price and output at the profit-maximising output does NOT guarantee that a firm will earn supernormal or normal profit. In fact, a firm can earn all 3 types of profit when it chooses to produce at the profit maximising output. Whether a firm earns supernormal profit depends on the average cost of the firm. Setting price and output at the profit-maximising output just means that at that level of output, this allows the firm to earn the maximum amount of profit.

(b) Discuss the strategies that firms can use to increase profits in the light of changing consumer mindsets. [15]

Question analysis:
Command word: discuss → evaluate the different strategies that firms can use
Concepts: pricing and non-pricing strategies to increase profits
Context: changing consumer mindsets towards social and environmentally friendly products

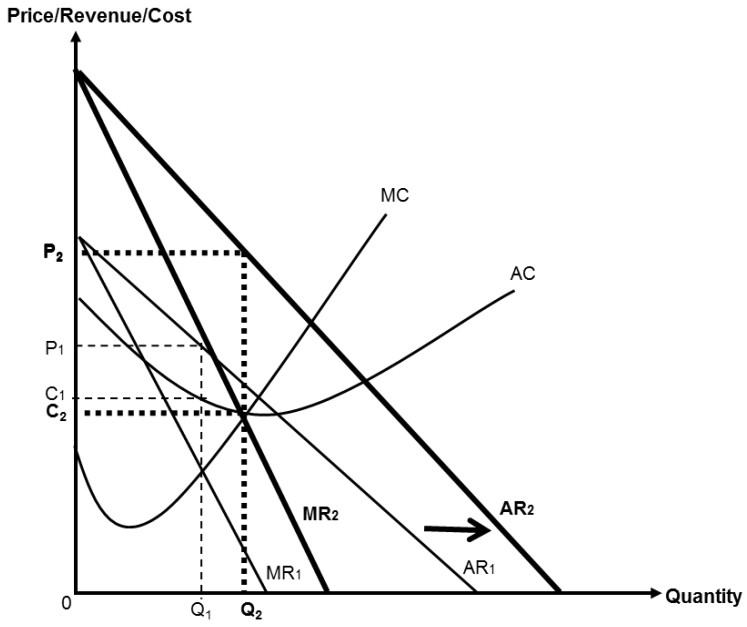
Question requirements:
R1: strategies that will increase revenue due to changing consumer mindsets
R2: strategies that will reduce costs

Suggested answers:

Introduction:
As mentioned in the pre-amble, consumers are changing their taste and preferences towards products that are more environmentally sustainable as well as more personalised shopping experiences. Firms who are able to cater to providing personalised experiences and produce products in an environmentally sustainable manner will experience and increase in profits.

Body:
R1: strategies that will increase revenue

Advertising
Firms can undertake advertising to promote their products as being more environmentally friendly or to highlight changes that they have made to their choice of packaging, such as the use of less plastics or biodegradable packaging. These would help to increase the firm's demand and made demand for the firm's product less price elastic.



As seen in the figure above, assuming that advertising is successful, demand for the firm's products will increase from AR1 to AR2. Demand will also become relatively more price inelastic as consumers do not view other firm's products as being close substitutes. As a result, of the increase in demand, the price of the firm's products will increase from P1 to P2 and the output sold will increase from Q1 to Q2. Given that both price and quantity increases, total

revenue will increase. Assuming that the increase in cost incurred due to advertising is less than the increase in total revenue, profits will increase.

Limitations of advertising
Increase in total revenue depends on the success of advertising, if the advertising is not as successful, or if all other firms also undertake similar advertising strategies, the individual firm may not see a significant or any increase in demand for their products. In which case, the cost incurred by the firm to advertise may instead lead to a fall in profits.

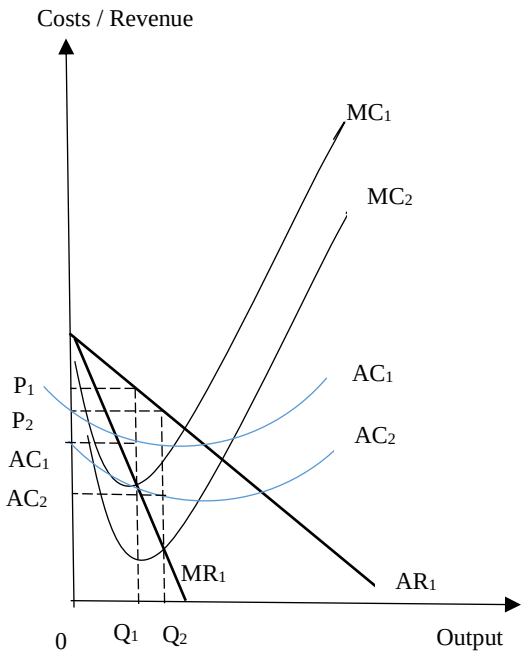
R&D
Another strategy that firms can undertake is to conduct R&D to innovate new products or to develop new products that are more environmentally friendly. Similar to advertising, the impact will be to increase demand and make demand relatively more price inelastic. For example, Nike embedded sustainability into its innovation process and created the $1 billion-plus Flyknit line, which uses a specialized yarn system, requiring minimal labor and generating large profit margins. Flyknit reduces waste by 80% compared with regular cut and sew footwear.

Limitations of R&D
Depending on the type of market structure the firm is in, affects the ability to conduct R&D as well as the type of R&D that can take place. For example, oligopolistic firms are more likely to be able to do R&D as they are likely to earn supernormal profits due to high barriers to entry. The innovation is also likely to focus more on actual improvements and development of new products rather than superficial improvements. This would likely help increase the demand more significantly as consumers can see real differences in the product offerings.

R2: strategies that will reduce costs

R&D
R&D can also be in terms of process innovation. Process innovation takes the form of new or improved production processes, which can raise productivity or lower the unit costs. Process innovation thus results in a lowering of marginal and average costs (shift in MC and AC). For example, 3M used to produce adhesives in batches that were then transferred to storage tanks. One bad batch could spoil the entire contents of a tank. Lost product, downtime, and expensive hazardous-waste disposal were the result. 3M developed a new technique to run rapid quality tests on new batches. It reduced hazardous wastes by 110 tons per year at almost no cost, yielding an annual savings of more than $200,000.

With reference to the figure below, when there is successful R&D process innovation, the marginal cost will shift down from MC1 to MC2 and AC shifts down from AC1 to AC2. Price then changes from P1 to P2 and quantity increases from Q1 to Q2. Overall due to the fall in AC, profit increases.



Growth by internal expansion or through mergers

With the creation of new products that are more in line with consumers' taste and preferences, this could lead to an increase in the firm's scale of production. The firm could then reap internal economies of scale such as marketing EOS. The firm will be able to spread out its advertising cost over a larger output resulting in a fall in average cost. With a fall in average cost, profits will increase.

Alternatively, firms can acquire other firms that are more environmentally sustainable to acquire the technology and know how of creating a sustainable business. These firms would then be able to save on the R&D on 'greening' their production processes, lowering their AC and increasing profits.

Limitations

Internal expansion depends on whether there is an increase in demand sufficient to allow the firm to expand its scale of production. In addition, acquisition of another firm involves high cost and it may not be as easy to green the production process of the existing firm. Due to the different cultures of the firms, it may lead to internal diseconomies instead, leading to an increase in average cost.

Conclusion:

To increase a firm's profits, there is a need to consider how to increase revenue and reduce cost. In the context of changing consumer preferences towards environmentally sustainable productions and processes, firms should take the step towards creating products that appeal to those consumers which will increase their revenue. However, it is insufficient to just try and increase the demand for their products, firms should also consider how to reduce cost by greening their production processes as well.

Level	Knowledge, Application, Understanding and Analysis
L3 **8 – 10**	For an answer that has • Provided a developed analysis of how strategies that firms can use to increase revenue and reduce cost. • Considers the context of consumer's increased preference for sustainable products and processes.
L2 **5 – 7**	For an answer that has the following: • Provided a developed analysis of how strategies that firms can use to increase revenue OR reduce cost. • Weak consideration of the context of consumer's increased preference for sustainable products and processes. OR • Some explanation of both revenue and cost strategies but lack rigours or inconsistent application of economic concepts.
L1 **1 – 4**	For an answer that has the following: • Lack of economic analysis in how firms can use different strategies to increase their profits. • Largely descriptive rather than analytical
E3 **4 - 5**	Well explained evaluative judgments about 2 requirements + a summative conclusion
E2 **2 – 3**	Evaluative judgments about 2 requirements, one of which is well-explained
E1 **1**	Unsupported evaluative statements or one explained evaluative judgment

Examiners' Comments:

General Comments:
This part of the question was better attempted by candidates as candidates were generally able to explain strategies that would help the firm increase profits. However, a significant number of candidates also didn't score as well as they focused on pricing and non-pricing strategies which only addresses the revenue aspect and neglected to consider strategies to reduce cost.

Question Analysis Issues:
- Candidates need to be more cognisant of the terms in the question. The question required students to explain and evaluate strategies that a firm could use to increase profits and not maximise profits. Increasing profits would simply involve the increasing of revenue or the reduction in costs.
- Candidates also need to move away from providing templatised answers that fail to consider the context of the question. A significant number of candidates quoted examples from their notes wholesale which had no relation to the context of the question. While in this examination, they were not penalized, it showed a lack of ability to respond directly to the question set.