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## ECONOMICS Higher 2 Syllabus 9570

Examiner's Report

Year 5 Promotion Examination 2022



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### ECONOMICS

#### Y5 H2 Promotion Examination 2022



Case Study

(a) With reference to Figure 1,

(i) describe the trend in the revenue of the US pharmaceutical industry from 2014 to 2019.

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[2]

- **General trend:** There has been an increase in the total revenue for the US pharmaceutical industry over the whole period.
- **Refinement:** The sharpest increase occurred between 2017 to 2018.

#### Mark Scheme:

- 1m for overall trend
- 1m for refinement

#### Examiners' Comments:

- This question was generally well done but some students failed to surface the most significant refinement, or used the wrong time period. Please be mindful of the period given in the question and that given in the data.
- (ii) explain one possible reason why the decrease in revenue of the US pharmaceutical industry is expected to continue beyond 2020. [2]

Students are expected to explain any plausible reason with links to change in price, quantity, and hence revenue.

#### Explain one demand factor:

- Fall in demand as population is getting healthier
- Fall in income due to recession caused by Covid-19
- The fall in demand leads to a fall in both P & Q and hence TR.

OR

#### Explain one supply factor:

• An increase in supply of generic drugs due to the expiry of patents, and given that demand for drugs is price inelastic due to a high habituality of consumption, the fall in price only leads to a less than proportionate increase in quantity demanded and hence a fall in TR.

#### Mark Scheme:

- 1 *m* for reason explained
- 1 m for link to effect on TR with an explicit link to P and Q

#### Examiners' Comments:

- A significant number of students lost marks because there was no explicit link to P and Q in explaining total revenue change.
- Those who identified price fall (due to increase in supply, or due to government regulation) did not use PED to link to total revenue.
- Many said increase in R&D spending reduced revenue, suggesting a confusion over revenue and profits
- (b) With the aid of a diagram, explain whether an increase in a firm's research and development spending will always increase its profits. [5]

#### Short-run

In the short-run, an increase in a firm's research and development spending represents an increase in the firm's fixed costs, since such spending does not vary with the current level of output produced by the firm. Hence there will be a rise in AC from  $AC_0$  to  $AC_1$ , without any change in the profit-maximising output of  $Q_0$ .



Firm's profits have fallen from  $(P_0 - C_0) \times Q_0$  to  $(P_0 - C_1) \times Q_0$  in the short-run.

#### Long-run

When a firm's R&D spending is successful, it results in the creation of new drugs such as Daraprim and Sovaldi that cater to the needs of consumers more, increasing its demand from AR<sub>1</sub> to AR<sub>2</sub>. Furthermore, demand for the firm becomes more price inelastic as there are fewer substitutes to the new drug which may treat new illnesses or be more effective. Hence the firm's price-setting ability will increase, leading to a higher price of P<sub>2</sub> being charged at the higher profit-maximising output of Q<sub>2</sub>. The rise in demand causes a rise in PXQ causing TR to rise.

Firm's profits have increased from (P<sub>1</sub>-C<sub>1</sub>)  $x Q_1$  to (P<sub>2</sub>-C<sub>2</sub>)  $x Q_2$ , assuming that the R&D efforts have been successful.



#### Conclusion

The impact of R&D spending will definitely result in a fall in firm's profits in the short-run, but the long-run impact is uncertain. Profits will increase if the increase in TR outweighs the increase in costs, but the outcome of R&D is uncertain. Such uncertainty is supported by Table 1 - while Pfizer's huge spending seems to yield a direct relationship with its TR ceteris paribus, that of Merck's (the 3rd largest spender) seems to point otherwise. Furthermore, the outcome of R&D is uncertain and may not lead to new medicines being developed – thus no effect on TR.

#### Combined diagram:



#### Mark Scheme:

- 2m for explaining increase in TR with reference to case material
- 1m for diagram
- 1m for explaining R&D increases fixed costs
- 1m summative statement on final effect, e.g. effect is uncertain
- No reference to case material max 4

#### Examiners' comments:

 Many did not make reference case material at all, some even discussed product differentiation with respect to iPhones!

- R&D is a fixed cost and does not shift MC curve, while process innovation would change a firm's variable cost of production, shifting both MC and AC curves.
- Poor diagram conventions, e.g. lack of labelling of axes, curves; failed to indicate profits accurately
- Many did not explain potential revenue increase from product innovation, which is the more prominent form of R&D in pharmaceutical industry.
- Some did not have balanced explanations for "explain whether", and many fell short of making a final conclusion.
- Many incorrectly used market analysis to explain a firm's profit changes.
- Some did not analyse the immediate impact of rise in R&D spending on profits and went off tangent (e.g. explaining how patents granted to new medicines may increase profits)
- Some mistook total revenue for profits.

#### (c) Wealthier countries pay "about the cost of a takeaway meal for each dose," while middleincome countries pay roughly half that price'.

#### Explain why this is a form of price discrimination.

[3]

- Define price discrimination: Firm selling of the same good to different consumers at different prices for reasons not associated with differences in cost of production.
- Pharmaceutical firms are able to segment markets by different geographical locations with differing PED.
- Drugs take up a lower proportion of income for wealthier countries, making demand relatively more price inelastic, hence a higher price is charged.
- On the other hand, for middle-income countries where drugs take up a higher proportion of income, hence a lower price is charged.

#### Mark Scheme:

- 1m for recognizing price discrimination is due to difference prices for reasons not associated with cost differences
- 2*m* for explaining why different countries are charged different prices due to differences in PED, with explicit link to the relevant PED determinant

#### Examiners' comments:

- Many did not state PED determinant explicitly when explaining differences in PED
- Many showed a weak understanding of price discrimination with irrelevant concepts explained, e.g. explanation of how PD achieves equity
- Many missed out the "no cost difference" element of PD.
- Some answers addressed "explain why firms can price discriminate", rather than "explain why this is an example of PD"
- Many had imprecise descriptions of PED (e.g. vaccines are price elastic, price is elastic for vaccines, the demand is elastic, etc., all of which are inaccurate)

### (d) To what extent is government intervention necessary in research and development in the pharmaceutical industry/. [8]

#### Introduction

• Government intervention is necessary to correct market failure arising from positive externalities in production of R&D to achieve allocative efficiency.



#### Thesis: government intervention is necessary in the market for R&D

- From Extract 3, 'R&D entails significant externalities that are difficult to capture by the private innovator' in the pharmaceutical industry.
- Hence there is a positive production externality occurs when external benefits are enjoyed by third parties from the production of research and development (R&D) by pharmaceutical firms.
- When one firm engages in R&D ventures, its private benefits include the potentially higher profits that can be earned (as shown in (b)).
- However, over and above the private benefits of the research, there are external benefits that
  extend beyond the firms that finance it, i.e. MEB > 0 (or negative external costs, MEC < 0). If other
  firms also have access to the results of the research, there are external benefits to society as a
  whole not only does the society benefit from better quality drugs that are being produced, other
  firms will also benefit from the reduction in duplication of research costs. Hence society as a whole
  will benefit from the production of greater R&D that is shared among different firms.</li>
- However, the private firms that engage in R&D are not compensated by the third parties for financing the R&D projects and generating these external benefits. To the private firms, the MPC (i.e. the opportunity costs of the resources used in R&D projects incurred by themselves) is higher than the MSC (i.e. what the society values as the opportunity costs of the resources used). This creates a divergence between the MPC of financing R&D projects perceived by the private firms and the MSC of R&D perceived by the society as a whole, where MPC is higher than the MSC.
- Assuming no consumption externalities, MPB = MSB.
- Under perfect competition, the free-market equilibrium output of the market is at OQe units where MPC=MPB. The socially optimal output level is, however, higher at OQs units, where MSC = MSB. Thus, there is an under-production of R&D projects by QeQs. The free market output at OQe is thus allocatively inefficient and there is an under-allocation of scarce resources to R&D projects, resulting in a DWL of AEE1 to society.
- Hence 'government support for research and development (R&D) is critical, especially when it comes to vaccines' from Extract 3, as 'the gap.. between social and private rates of return to inventions results in significant underinvestment in R&D.'
- <u>Additional Idea:</u> This problem could be compounded by the uncertainty involved in R&D. The high risks inherent in R&D, due to uncertainty and high sunk costs, may cause pharmaceutical firms not to engage in it as they are able to reap supernormal profits regardless, due to the existence of high barriers to entry.

#### Antithesis: Government intervention is not necessary in the market for R&D

- 1. Firms have sufficient willingness and ability to invest
- Pharmaceutical companies are operating in a competitive oligopoly market structure where they have the willingness and ability to invest in order to survive. The key to surviving in such an industry is to develop new medicines and vaccines to increase market share and dominance.

- From Figure 1 and Table 1, pharmaceutical firms have more than sufficient revenue in the billions to plough back into R&D efforts even without any government intervention. And it is indicated in Extract 2 that they could have devoted more of their profits towards efforts in R&D instead of marketing and sales.
- In addition, they have the willingness to do so as significant R&D spending can act as a barrier to entry for new firms, and possible drive out existing ones as R&D can raise the entry costs to the industry.
- And they are able to do so due to their past supernormal profits that might have arisen as a result of their 'price gouging' as they retain monopoly power over the drugs they produced.
- 2. The necessity of intervention also depends on the extent of the MEB. And this may be different for different drugs or vaccines. In the case of vaccines for a worldwide pandemic such as Covid- 19 where the MEB is very significant, intervention is essential. However, in the case of certain medicine such as those for aesthetic purposes, intervention is less necessary.

#### Judgment

#### Summative Statement

- Due to huge positive externalities in the production of R&D for certain drugs and vaccines, government intervention is necessary, especially during pandemics like Covid-19.
- But given the willingness and ability for firms to conduct R&D, it can be argued that intervention may not be necessary for all drugs.

#### Any 1 further insight

- While government intervention is necessary, it may also take many forms, from subsidies to legislation to mandating the sharing of information. Different governments may choose different forms of intervention depending on their situations. For instance, only governments with sufficient budget can afford to subsidise large amounts needed for R&D, while only governments that have the ability to enforce legislation (e.g. 'to share cell lines') will choose to do so.
- Strain on government budget (in the case of using subsidies)
  - Subsidising R&D entails huge amounts of government spending. From Extract 3, the United States and Germany poured approximately \$2 billion and \$1.5 billion into the efforts for the Covid-19 vaccine.
  - Such expenditure might not be possible for all countries as some countries may not be able to take such strain on the government budget and may also incur opportunity costs in other essential areas such as the need to alleviating poverty.

#### Mark Scheme:

Knowledge, Application, Understanding, Analysis		
L1	<ul> <li>Smattering of points and not directly linked to question</li> <li>Descriptive answer without the use of an analytical framework</li> <li>Conceptual inaccuracies.</li> </ul>	1 - 3
L2	<ul> <li>An answer that elaborates on the necessity of government intervention in the market for R&amp;D by arguing based on economic framework of market failure in the market of R&amp;D and the market structure that pharmaceutical firms operate in.</li> <li>Balanced argument where thesis and anti-thesis are present.</li> </ul>	4 - 6
Evaluation		
E1	An unexplained or weakly supported or ambiguous judgement.	1

E2	Evaluative assessment supported by economic analysis – one	
	explanation for stand would be sufficient on the extent of government	2
	intervention necessary.	

#### Examiners' Comments:

- Many did not provide in-context examples of MPB/MPC/MEB.
- Many explained MEB of consumption of vaccines, e.g. instead of production of R&D.
- Similarly, those who explained government intervention for market dominance were referring to market for pharmaceutical drugs and not R&D.
- Many did not take note of the question of "is government intervention 'necessary", but turned the anti-thesis into "how should' governments intervene".
- Some mistook this "source of market failure" question as an "effectiveness of policy" question and explained effectiveness and limitations of policies at length.
- Some incorrectly thought "public funding" is "funding by the general population" while in reality, "public funding" is just "government spending" (in the same way public housing is provided by the government, not by people on the street).

### (e) To reduce the adverse effects of market dominance, some countries have proposed the removal of patents, while others have implemented pricing regulation.

### Discuss whether the removal of patents for pharmaceutical firms is more beneficial than pricing regulation in improving outcomes for consumers. [10]

#### Introduction

- Government intervention in the pharmaceutical drug industry is necessary to remove the adverse
  effects of market dominance on efficiency and equity.
- By implementing policies such as removal of patents or pricing regulation, it may improve consumer welfare in terms of price, quantity, quality and choice.

#### Policy 1:

#### Thesis: Explain how removal of patents works to improve consumer welfare



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- The removal of patents will lower the barriers to entry of entering the pharmaceutical industry, leading to an increase in the number of firms and reducing the market share of the incumbent firm, assuming the market size remains constant.
- This is needed as 'the pharmaceutical sector can potentially abuse market power for necessary medicines' (Extract 2). 'As a case in point, Turing Pharmaceuticals raised the price of Darapri by 5,500%, illustrating how the absence of competition can lead to price gouging. And Gilead's decision to sell Sovaldi for \$84,000 per course of treatment raised the question whether society must accept any price set by the patent holder'.
- Hence, the loss of market share leads to a fall in the demand for the incumbent, as well as an increase in price elasticity of demand due to the availability of more substitutes, as illustrated in diagram above.
- As demand falls and becomes more price elastic, AR and MR curves shift from AR<sub>1</sub> to AR<sub>2</sub> and MR<sub>1</sub> to MR<sub>2</sub> respectively, and become gentler. The profit-maximising equilibrium price and output fall from P<sub>1</sub>, Q<sub>1</sub> to P<sub>2</sub>, Q<sub>2</sub>.
- Consumer welfare rises as they pay a lower price of P1 for pharmaceutical drugs as firms have less ability to charge a high mark-up. With lower prices, lower-income households will also enjoy these drugs that were previously inaccessible, reducing inequity.
- This can resolve the problems of price gouging and inequity as mentioned in the Extract 2. Furthermore, 'unlike consumers of ordinary goods, patients with medical needs may not be in a position to defer consumption until prices fall', and it can be seen to be inequitable that patients are denied the right to access lifesaving drugs due to exorbitant prices charged.

#### Anti-thesis: Limitations of Patent Removal

- (a) <u>Removal of patents severely reduces the willingness of firms to innovate to produce new and better</u> <u>drugs</u>
- From Extract 1, efforts to suspend patents 'would jeopardise future medical innovation' as 'intellectual property rights, including patents, grant inventors a period of exclusivity to make and market their creations'.
- Such patents reward producers for undertaking the risk and costs in developing a new medicine, and the removal of patents will reduce the willingness of firms to innovate as they no longer have 'a shot at a reward'.
- With less R&D, the quality and speed of creating new drugs will be hindered, leading to a loss of consumer welfare.

#### Policy 2: Pricing regulation

#### Thesis: Explain how pricing regulation works



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- Before pricing regulation, a pharmaceutical firm maximises profit where MC=MR, producing at Q<sub>1</sub> and charging price at P<sub>1</sub> for a drug.
- With marginal cost pricing P<sub>MC</sub>, consumers get to enjoy a significantly lower price and a higher quantity of Qmc. Thus the medicine is made accessible and affordable even to those who could not afford initially. Moreover, P=MC is where allocative efficiency is attained.
- From extract 4, India's 'hardline stance on regulating drug prices' seems to be effective in helping the large number of consumers who lack the purchasing power to afford essential drugs.

#### Anti-thesis: Limitations of pricing regulation

- (a) Due to asymmetric information about firms' revenues and costs for pricing regulation
- Demand and cost curves can only be estimated and the regulated firm may withhold or distort information. The pharmaceutical firm may easily overstate its costs so it can charge more. Hence, price regulation may not effectively reduce the extent of inefficiency and inequity.
- On the other hand, no such regulation and enforcement are required for the removal of patents, as the reduction in price is achieved through a fall in price-setting ability.
- (b) Fall in profits leads to less ability to engage in R&D
- With a fall in profits from (P<sub>1</sub>-C<sub>1</sub>) x Q<sub>1</sub> to (P<sub>MC</sub> C<sub>2</sub>) x Q<sub>MC</sub>, there would be a fall in a firm's supernormal profits to plough back into R&D, negatively affecting innovation and dynamic efficiency, and hence consumer choice and quality of drugs.

#### <u>Judgment</u>

- 1. Comparison of policies
  - (a) <u>Removal of patents may be better than pricing regulation</u>
  - The removal of patents allows the free market to determine prices. With the increase in competition as more firms produce variations of the same drug, prices are likely to fall. Whilst pricing regulation also leads to a fall in prices, it may be less cost-effective for the government since monitoring costs are incurred to ensure firms adhere to it. Moreover the issue of firms withholding actual cost data also reduces the effectiveness of pricing regulation.
  - With the entry of more firms and intensification of competition, consumers get to enjoy more choices
    with more firms providing variations of the same drug. And the bid to increase their share of profits
    may spur firms to improve on the quality and efficacy of these drugs. Conversely, pricing regulation
    may not have such an effect since there is no effect on competition.
  - Removal of patents targets the root cause of market dominance as 'patents award rich profits to firms' (extract 2) and are the main source of barriers to entry in the pharmaceutical industry. This has perhaps caused these firms to spend more on 'marketing and sales' that may not have a tangible effect on consumers compared to the development of new drugs from R&D. Whilst it is often argued that patent removal may disincentivise R&D, an opposite effect can arise. The intensification of competition can sometimes incentivise firms to engage in R&D. Incumbent firms will be forced to step up in terms of innovation to create better quality drugs that are more effective in the face of potential loss of market share with entry of new firms. As such, consumers can now enjoy better quality medicine, raising the consumer welfare.
  - (b) Pricing regulation may be better than patent removal
  - There is greater certainty in pricing regulation since the price is mandated by the government. Moreover, this has a more immediate effect and is useful for countries that seek to reduce prices to make it more affordable for the poor. On the other hand, the effect on prices for patent removal

may take place over a longer time horizon as new firms need time to copy and improve on the existing technology.

• Removal of patents may not reduce market power significantly especially in the immediate period since new firms take time to develop the drug. In addition, the incumbent firms' price-setting ability may not be reduced with entrenched customer loyalty as consumers have more faith in the established brands.

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• Removal of patents reduces the ability of firms to reap internal economies of scale, while pricing regulation may increase that ability with a larger output. The removal of patents will allow more firms into the industry, and hence each firm can only produce at a lower output. As a result, there is less scope for firms to lower LRAC, and the higher costs may be passed to consumers in the form of higher prices.

#### Summative Statement

- All things considered, both measures reduce the firms' supernormal profits and such profits are necessary for them to engage in R&D and in circumstances such as the pandemic for them to provide essential vaccines on a not-for-profit basis to developing countries.
- Both measures can used in tandem as in the case of India. While the relaxation of patents facilitates a sustained fall in prices and increase in choices, pricing regulation allows for an immediate fall in price that meets the needs of the poor.

#### <u>Mark Scheme</u>:

Knowledge, Application, Understanding, Analysis			
L1	<ul> <li>Smattering of points not directly linked to the question</li> <li>Mere listing of points that lack depth of economic analysis and justification</li> <li>No reference to the economics framework</li> </ul>	1-3	
L2	<ul> <li>Balanced T/AT approach in discussion of both policies</li> <li>Analysis has rigour in terms of diagram and framework to show how policies improve consumers' welfare using appropriate yardsticks</li> </ul>	4-7	
	Evaluation		
E1	An unexplained judgement → An unexplained evaluative conclusion	1	
E2	• Evaluative assessment supported by economic analysis e.g. based on differing contexts and time periods to justify which policy is more suitable	2-3	

#### Examiners' comments:

- Question asked for policies to remove effects of market dominance but many used dd/ss framework where there is no market dominance since it assumes perfect competition!
- On a similar note, many said price regulation causes a shortage / black market using dd/ss framework, but pricing regulation on a firm diagram would increases Q, making this point irrelevant.
- Many linked to society's yardsticks instead of consumer's.
- Many analysed MC/AC pricing using natural monopoly's diagram while pharmaceutical industry is oligopolistic.
- Some mistook "PED for vaccines" to be the same as "PED for vaccines produced by a particular firm" and argued that removal of patents would make demand for vaccines more price elastic which is imprecise.
- Many evaluations are mere summaries of previous discussions without adequate comparison between the two policies.
- Many did not apply the context of pharmaceutical industry throughout the discussion and gave a purely theoretical treatment.

- Some identified AC/MC price and output wrongly on the diagram.
- Some mistook price regulation for price discrimination or lump-sum tax
- Many explained how patents work instead answering the question on the effects of patent removal.

#### Question 1

The price of chicken is skyrocketing in Malaysia. Driven partly by rising chicken feed prices, the price of live chicken has surged to RM17 per kilogram in June 2022, nearly double the price of that in June 2021. The government is looking seriously into the implementation of an export ban on chicken.

ChannelNewsAsia 27 May 2022

- (a) Explain why the market price of chicken has risen sharply in Malaysia. [10]
- (b) Discuss the appropriateness of possible government policies to keep the price of chicken affordable in Malaysia. [15]

#### Part (a)

#### Introduction:

The market for chicken equilibrates at where demand for chicken intersects with the supply of chicken. Chicken is produced and consumed as food. Demand reflects an inverse relationship between the price of chicken and quantity demanded, according to the law of demand. Supply reflects a positive relationship between the price and quantity supplied according to the law of supply. We assume that this market is perfectly competitive, where there are numerous chicken sellers with insignificant market share. The price of chicken rises sharply due to changes in the determinants of demand and supply, with price elasticities taken into consideration, ceteris paribus.

#### Body: Explain 3 reasons (1 DD, 1 SS and PED or PES) for the sharp rise in price of chicken

#### Supply factors: The fall in SS of chickens $\rightarrow$ rise in price of chicken

- <u>Factor 1:</u> Rise in cost of production: the rise in price of chicken feed has been consistent and sharp. Chicken feed is essential in the rearing of live chickens. Hence, the cost of rearing chickens will rise sharply for chicken farmers, as chicken feed is assumed to comprise a large proportion of total cost of rearing chickens. This raises the cost of producing chicken.
- As such, the supply of chicken would fall, as producers are not willing to supply as much chicken at each price, ceteris paribus.
- Factor 2: Fall in number of producers: the closure of farms could have occurred during the COVID period where disruption in the supply chains in Malaysia has caused problems in operations, for example, workers in the farm contract covid and cannot come to work, or delivery trucks are delayed in making their trips due to international shipment delays. All this make in unviable to operate chicken farms and eventual closure. Chicken distributors will face difficulty in obtaining chickens for sale, hence reducing the supply of chickens.

#### Demand factors: The rise in DD for chickens $\rightarrow$ rise in price of chicken

<u>Factor 1:</u> Rise in income due to rise in amount of economic activity: With the gradual lifting of work restrictions related to covid, restaurants are once again in full operation. Demand for chicken meat increases as a spate of economic activities rise and households demand for more chicken meat as household incomes rise as hiring of workers increases. Thus, catalyzing the rise in demand for chicken which is a normal good.

- <u>Factor 2:</u> Rise in relative price of substitute for chicken: with the higher rise in the price of beef or mutton, substitutes in consumption in relation to chicken, consumers turn to the relatively cheaper substitute (chicken), and demand for chicken rises.

#### Factors related to PED/PES: PED < 1 and/or PES < 1 $\rightarrow$ sharp rise in the price of chickens

- PED<1: habitual consumption for chicken meat as a source of protein hence its PED<1, or lack of close substitutes for meat as other types of meat are relatively more expensive than chicken. A rise in price of chicken will lead to a less than proportionate fall in qty demanded, cet par.
- PES<1: For live chickens it takes a relatively long time to rear a chicken from it's young, to be ready for slaughter. This gestation period is relatively longer compared to vegetables or manufactured items. Hence, PES <1 for chicken. This is even more so, given supply chain disruptions (fall in SS of chicken feed) as mentioned earlier, where there is immobility of factors of production to raise quantity supplied in the face of rising demand. A rise in price of chicken will lead to a less than proportionate increase in qty supplied, cet par.</li>

Any of the above changes in demand or supply side non-price determinants would lead to a sharp rise in the price of chicken, this is illustrated in the diagrams below.



With reference to Diagram 1 the fall in supply from S1 to S2 leads to a shortage of Qs'Q1 at P1. The upward pressure on price and subsequent rise in the price of chicken leads to a fall in quantity demanded along D1 as consumers are less willing and able to purchase chicken due to falling real income and consumers switch to cheaper substitutes, and rise in quantity supplied along S2 as producers are more willing and able to produce chicken as it becomes more profitable. Given that PED < 1, there needs to be a significant increase in price for the shortage to be cleared. The new market equilibrium will be at P2 and Q2 where the qty demanded = qty supplied. Thus, the fall in supply of chicken leads to a sharp rise in price of chicken from P1 to P2.

With reference to Diagram 2 below, the rise in demand causes a further shortage of Qd'Q2 at P2. Given that PES < 1, it requires a significant rise in price to clear the shortage. The price adjustment process will cause the market equilibrium price to increase from P2 to P3 and quantity to increase from Q2 to Q3. Thus, the rise in demand for chicken leads to a "sharp" rise in price from P2 to P3.

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<u>The simultaneous changes</u> of both demand and supply, augmented by low elasticities of demand and supply, have led to a <u>significant</u> rise in the price of chicken.

Note: students may analyse the change in price using separate diagrams or combined diagram. Other nonprice factors of demand such as seasonal rise in demand due to festive seasons etc, and other non-price factors of supply can be accepted if reasonably explained.

Level	Knowledge, Understanding, Application, Analysis	Marks
L1	<ul> <li>Journalistic writing without use of relevant economic concepts and theoretical framework</li> </ul>	1-4
	<ul> <li>Poor or inaccurate application of the determinants of dd and ss, and of elasticities.</li> </ul>	
L2	<ul> <li>Some theoretical framework of analysis given to explain the sharp rise in the price of chicken meat but</li> </ul>	5-7
	<ul> <li>Limited number of factors given to explain changes in demand and supply</li> </ul>	
	<ul> <li>Only ss side or dd side analysis excluding PED/PES application.</li> </ul>	
	<ul> <li>Limited analysis using the price adjustment mechanism</li> </ul>	
	<ul> <li>No application of elasticities</li> </ul>	
	<ul> <li>Lack of application to the given context, limited depth of application.</li> <li>Limited contextual explanations and examples and use of preamble.</li> </ul>	
L3	<ul> <li>Well-explained factors with contextual use of the preamble and</li> </ul>	8-10
	contextual explanations.	
	<ul> <li>Excellent use of theoretical framework of analysis to explain the sharp</li> </ul>	
	rise in the price of chicken meat.	
	<ul> <li>Accurate and complete application of PED or PES</li> </ul>	

#### Mark scheme:

#### Examiners' comments:

Part (a) of the question is generally done well and most students were able to get high L2 marks. The structure and content in most students' scripts were well-organised and theoretically sound, and most used appropriate economic framework in their explanation. However, there are some areas of concern:

- Insufficient scope of explanation:
  - There were students who restricted their analysis to only what is given in the preamble. This group of students did not analyse any non-price determinants of demand and were not able to get beyond L2 marks. Students should note that not all information can be provided in a short preamble and they should not be restricted by it. They should also learn that when the focus of the question is on "price", they should always consider <u>both</u> DD and SS factors (unless it does not make sense).
  - Given that the focus of the question is on price risen "sharply" far too many students only looked at the rise in price and not the extent of the rise in price. These scripts were also not able to get beyond L2 marks.
- Lack of depth of explanation:
  - Given that the focus of the question is on price, students are required to elaborate on the priceadjustment process in detail – shortages → upward pressure on price → as price rises, Qd and Qs changes (why?) → new equilibrium P/Q reached (when?). Students who did not explain this in detail were not able to get L3 marks.
  - Across the board, there was also lack of depth in explaining the determinants of demand and supply. For e.g. most students who looked at income as a factor simply said that there is a rise in income in Malaysia/Singapore without any context. A good response would have given reasons for the rise in income such as economic growth from post-covid recovery and lifting of restrictions causing greater economic activity. A good response would also look at YED when analysing a change in income. There were also students who said that there was a change in taste and preferences towards chicken without justifying why. Is it because of rising awareness of health benefits of white meat vs red meat? Similarly, when looking at supply factors most were content with saying that the price of chicken feed as increased → fall in supply. A good response will be to bring in supply-side shocks such as the Russia-Ukraine conflict, supply chain disruptions due to closure of borders during Covid and how the rise in price of feed will lead to a rise in COP as feed is an impt factor input in chicken production.
- Other gaps:
  - There were a minority of students who incorrectly labelled a shortage as an area rather than the difference between Qd and Qs at a given price.
  - Some had written that chicken feed and chicken are in joint demand / complements. This means that every time you buy chicken, you buy chicken feed too. Do you eat chicken feed when you eat chicken? Chicken feed is a factor input in the production of chicken and it is not in joint demand.
  - A number of students wrote about chicken feet instead of chicken feed 😊. Be careful.
  - Some students argued that chicken is an inferior good in Malaysia, and thus the fall in income due to Covid has led to a rise in DD for chicken as YED < 0. While it is theoretically possible, this line of argument is not convincing as it is hard to justify why chicken is an inferior good. Does it taste worse than other types of meat? Does it have lower nutritional value? Chicken tastes pretty good to me, especially fried chicken!
  - Most students were not able to explain how PED and PES values affect the extent of change in price. There were a minority of students who did this well. kudos to them! Most of you went along the lines of if PED<1, the fall in SS will lead to a more than proportionate rise in price as compared to a fall in quantity demanded. Note that 1. the concept of PED is about how the change in price affects the quantity demanded, not the other way round, and 2. that is not an explanation on how prices rose sharply. A good response will explain how the shortage can

only be cleared when prices increased significantly given that consumers/producers are not responsive to changes in price.

#### Part (b)

#### Introduction:

- The government can carry out several policies to keep the price of chicken affordable in Malaysia, for the objective of achieving equity in the market for chicken.

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- These policies can be assessed against the benchmarks of effectiveness in keeping down the price of chicken, and desirability, i.e. the maximization of social welfare, without being in severe conflict with other microeconomic and/or macroeconomic objectives. All these benchmarks contribute to the criteria of appropriateness of a policy.
- These policies would be the export ban, the price ceiling and the indirect subsidy for chicken farmers.

#### Body: Discuss 2 + 1 policies (2 in-depth and 1 in brief)

### Thesis - Policy 1: The export ban is appropriate in achieving affordability of chicken in Malaysia and would be appropriate in achieving this goal

By banning the export of live chicken, local Malaysian farmers will have to sell all their chickens to the domestic market, increasing the supply of chickens from before or could dampen the fall in SS due to rise in price of chicken feed. With the surplus of Qs'Q1 at the current market price P1, there will be downward pressure on the price of chickens. Given the price-adjustment process, prices will adjust until market price of chicken falls from P1 to P2 → this leads to a rise in affordability as real income rises and consumers increase the quantity of chicken consumed from Q1 to Q2.



Effectiveness in achieving affordability:

- In the short-run, the chicken farmers will have no choice but to **sell their chickens in the domestic market**. Any delay in doing so will lead to loss of revenue and profits.
- Given that PED < 1, price of chicken is likely to fall significantly, thus increasing affordability.
- This fall in price of chickens will make food more affordable for households.
- The policy will be effective given that it legally mandated by the government and any producers caught flouting the ban will face penalties.

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**Note:** Students may also analyse the export ban through the fall in demand for chickens produced by Malaysian farmers, if they have considered the combined market demand for both Malaysia and Singapore as a single market  $\rightarrow$  World Market for M'sian Chicken. The fall in demand leads to a fall in equilibrium price and thus rise in affordability. However, the fall in total revenue earned by farmers due to the loss of Singapore as a foreign market has implications on the desirability of the export ban.

#### Anti-thesis 1: The export ban has limitations and may not be entirely appropriate

The policy may not be effective:

- Depends on the penalties must be harsh enough to prevent illegal exports of chicken
- Depends on % of chicken reared that are exported → if it is not significant, then price of chicken may not fall significantly.

#### The policy may not be desirable

- Fall in profits for domestic producers
  - Seen in the diagram, the rise in supply of live chickens into the domestic market of Malaysia will cause a downward pressure on price and the price that equilibrates the market is at P1. The fall in price leads to a less than proportionate rise in quantity demanded. Hence, the fall in revenue due to the fall in price is more than proportionate relative to the rise in revenue due to the less than proportionate rise in quantity demanded. TR falls for chicken producers and profits may fall.
  - Alternatively, from the perspective of the Malaysian chicken producers, the export ban causes a fall in demand in the OVERALL market for Malaysian chicken (Msia, Singapore, other countries which they export to). Coupled with the rise in cost of chicken feed, profits will fall.
  - Small chicken farms may not survive given their thin profit margins → longer run, overall fall in SS of chicken → rise in price of chicken
- Loss of export revenue from other countries, such as Singapore  $\rightarrow$  fall in GDP  $\rightarrow$  worsen economic growth and SOL
  - The export ban will cause a fall in export revenue of Malaysia. The fall in export revenue will reduce Malaysia's GDP and dampen its economic growth. This may have implications on the standard of living in the country has income levels fall. The extent depends on how reliant Malaysia is on chicken exports as a source of economic growth.
  - If the export ban is prolonged, and Singapore deems Malaysia to be an unreliable trade partner
     → Singapore could look for alternative sources of chicken e.g. Indonesia. Even if the supply of chicken starts to increase in Malaysia in future (chicken feed price falls), demand for Malaysian chicken in the world market will remain low, affecting the farmers' profits, and the country's economic growth.

Evaluation: the export ban is appropriate to the extent that it is effective in increasing affordability as price of chicken falls. However, producers of chicken will be made worse off especially in the longer run. The government will have to weigh between equity as an objective vs economic growth and welfare of producers and implications on trade relations.

### Thesis - Policy 2: Price ceiling is appropriate in achieving affordability of chicken in Malaysia and would be appropriate in achieving this goal

- The price ceiling is a legally established maximum price for chicken that is below the current market price of chicken.
- The fall in price from Pe to Pmax will increase affordability for consumers.



#### Effectiveness in achieving affordability

- The **legal lowered price Pmax** of chicken would make these chicken **more affordable** and in turn translates into lower prices for chicken products like chicken rice.
- However, this is if such a legal price is effectively monitored and penalty is severe enough for chicken distributors who flout the law, for example, selling chickens in the black market.

#### Anti-thesis 2: The price ceiling has limitations and may not be entirely appropriate

#### Ineffective:

- If there is <u>no effective monitoring</u> or heavy penalties for chicken distributors who see above the price ceiling, then chicken distributors will disregard such a price ceiling and continue to sell live chicken above Pmax, making the policy ineffective in ensuring affordability.
- In addition, the shortage apparently means that many consumers are not able to gain access to chicken, rendering such a policy rather ineffective as it is not accessible to all. Such shortage could drive up price of chicken in the black market (if the government does not police this market) from Pmax to P<sub>B</sub>.
- Chicken has become much less affordable than before the price ceiling was implemented.
- As the low monetary reward fails to compensate farmers for the opportunity cost of rearing live chickens. Farmers will not avail chickens for sale and divert resources to producing other types of animals for their meat instead, such as cows or sheep. This further aggravates the shortage of chicken in the domestic market.

#### Undesirable

- Distorts the free market  $\rightarrow$  welfare loss

Price ceiling distorts the free market mechanism and there will be inefficient allocation of resources. There is loss of societal welfare as there will be a deadweight loss of area ABC. This is due to the loss in producer surplus < gain in consumer surplus OR fall in both producer and consumer surplus (depending on the extent of fall in price vs the fall in quantity consumed or if there is a black market).

- Inequity

Inequity is worsened in light of much higher prices for consumers for chicken due to the black market. Consumer surplus falls to KaPb from KEPe. There is also inequity for those who do not get to buy chicken due to the need for rationing of the quantity of chickens as a result of the shortage.

Evaluation: the price ceiling may be appropriate in the short-run, given the immediacy of such a regulation to depress the price of chickens, but not appropriate in the long-run as chronic shortages and the black market appear. Policing is absolutely necessary to prevent the growth of such black markets, which implies

additional resource spent by the government just to ensure compliance. Furthermore, a chronic shortage does nothing to help consumers who cannot get their hands on chicken, only creating greater inequity.

#### Thesis - Policy 3: Indirect subsidies is appropriate in achieving affordability of chicken in Malaysia

- Malaysian government could give indirect subsidies to chicken farmers to alleviate the rising cost of chicken feed.
- The indirect subsidies act like a fall in cost of production → supply of chicken would rise. This surplus
  of Qs'Q1 will cause a downward pressure on price. As prices fall from P1 to P2, affordability will rise.
  Consumers will increase Qd of chicken as prices fall, and producers will increase the Qs of chicken as
  after subsidy price received (Pp) rises → rise in quantity of chicken from Q1 to Q2.



- Such a subsidy would be effective in reducing the price of chicken. Given that PED < 1, the fall in price could be significant.
- The policy is also desirable to both consumers and producers. Consumer surplus rises because price of chicken falls, and quantity consumed rises. Producer surplus rises as after subsidy price received rises and quantity sold rises.

#### Anti-thesis 3: Indirect subsidies may not be appropriate to increase affordability

- Effectiveness on raising affordability will depend on the amount of subsidies given. If it is insignificant, prices is unlikely to fall significantly and thus affordability is unlikely to be improve.
- Distortion of the free market will lead to inefficient allocation of resources and deadweight loss to the extent that there was initially no market failure. Cost of government intervention (subsidies) exceed the benefits from government intervention.
- Strain on government budget → other consumers and tax-payers suffer
  - Such subsidies come at the expense of the government's budget (govt expenditure = Area PpP2BA), and there will be high opportunity cost involved in such expenditures. These financial resources could be better spent elsewhere in providing more healthcare, education, even public goods. Many more can benefit in these markets and social welfare could rise. As such, overall welfare in society could fall as resources are transferred from these areas to subsidies to chicken farmers.
  - Tax-payers bear the brunt of such subsidies, even though they may not be consumers of chicken in the first place. If tax rates increase due to the need for heavy subsidies in the chicken

market, tax payers suffer the loss of disposable income and loss of welfare. Rising tax rates could also have other implications on the macroeconomy.

Note:

Students can also choose to explain direct subsidies for consumers, i.e. low income consumers. This policy could be a more sound measure to target the problem of equity. Other policies could also include subsidies for research and development for greater efficiency in chicken production.

#### Conclusion and Overall Evaluation:

- Students should make an overall judgement on the appropriateness of the policies to improve affordability of chicken in Malaysia, where appropriateness can be measured through effectiveness, desirability, feasibility, sustainability and other unintended consequences. Students may also compare appropriateness between policies in the context of Malaysia.
- Appropriateness of policies depends on Malaysia's valuation of equity/affordability of chicken vs other objectives such as economic growth or maximizing society's welfare.
- Comparison of policies:
  - Indirect subsidies is the most appropriate policy as it increases the affordability of chicken for consumers while allowing the price mechanism to operate in the allocation of resources, and alleviates the rise in cost of production, as compared to price ceiling and export ban where the producers will be adversely affected. However, the cost to the government is significant as compared to price-ceiling and export ban which does not require high government expenditure to fund the policy. Given the many competing priorities of the Malaysian government, in education and healthcare improvement for example, there would be high opportunity cost involved in prolonged subsidy expenditure.
  - Price ceiling is the most appropriate policy as it guarantees a fall in price of chicken through legislative means while subsidies and export ban does not impact prices directly and the rise in affordability depends on the extent of subsidies and % of exports in the overall market.
  - Export ban is the most appropriate as it need not be a long term measure and can be removed when food prices stabilize, while subsidies and price-ceiling may be harder to remove once implemented. Welfare of Malaysians should come first over other countries. Even if the policies come at a cost, food affordability should be prioritized.
- Suggestion of alternative policies:
  - Suggestion of improvements to current policies?
  - Malaysia should look for substitutes for chicken feed (given that it is the root cause of the rise in price of chicken) and be less reliant on countries for this important factor input. The government can also channel resources into stimulating research and development so that live chicken farms could explore productive, cost-savings methods of rearing, to increase the supply of chickens in the longer-run, so that they remain affordable in the domestic market.
  - o If the issue is equity, direct subsidies to lower income will address affordability most effectively.
  - Combination of policies for optimal outcomes in the SR and LR.
- Any other insightful points.

#### Mark scheme:

Level	Knowledge, Understanding, Application, Analysis	Marks
L1	<ul> <li>Journalistic writing without use of relevant economic concepts or</li> </ul>	1-4
	frameworks in explanations	
	<ul> <li>Significant errors or poor understanding of relevant economic concepts</li> </ul>	
	or frameworks	
	<ul> <li>Missing links to appropriateness of policy throughout</li> </ul>	

L2	<ul> <li>Relevant economic analysis with some gaps in development.</li> <li>Limited consideration for the context of the questions.</li> </ul>	5-7
	<ul> <li>Some errors in analysis</li> </ul>	
L3	<ul> <li>Good attempt at economic analysis with a robust theoretical framework</li> </ul>	8-10
	<ul> <li>The anti-thesis discusses these aspects with rigour - ineffectiveness in achieving affordability or desirability or feasibility or sustainability of each policy.</li> </ul>	
Evaluation		
E1	<ul> <li>A summative conclusion / unsupported evaluative statements or one explained evaluative judgement</li> </ul>	1 – 2
E2	<ul> <li>Two evaluative judgements, one of which is well-explained</li> </ul>	3 – 4
E3	<ul> <li>Two well-explained evaluative judgements with a summative conclusion</li> </ul>	5

#### Examiners' Comments:

Students are generally familiar with policies that can lead to lower price of chicken, and most are able to earn at least L2 marks. Some areas for improvement include:

- There were some inappropriate policy suggestions such as imposition of direct taxes to reduce the demand and thus price of chicken, or for the government to subsidise other meat markets so that the demand and price for chicken will fall. These are indirect measures.
- Many students rushed to complete 3 policy measures, without in-depth analysis of the workings of the policies and its limitations. Far too many did not explain how subsidies → rise in SS → fall in price, or what exactly a price ceiling is and how it reduces price in the market. The limitations based on the key word "appropriateness" allowed for a range of yardsticks such as effectiveness, desirability, feasibility and sustainability, but these were addressed by all students. Many also gave journalistic when explaining limitations without any use of economics framework. Students should note that given time constraints, 2 well discussed policies are better than 3 superficially discussed policies.
- Gaps in discussing the various measures:
  - Export ban Some students analysed export ban as a quota. This is flawed. Many students presented that total revenue of chicken farmers will fall with such a ban. Yet, there was no use of theoretical framework to justify this either with the use of PED (for the case where chicken supply in the domestic market rises along a demand curve that is price inelastic) or the fall in total revenue due to the fall in demand in the combined chicken market between Singapore and Malaysia).
  - Price-ceiling many students incorrectly identified the shortage with a price ceiling. They
    looked at the difference between the original qty and the new Qs instead than the new Qd vs
    new Qs at Pmax. The areas of CS, PS and DWL also tended to be wrongly identified.
  - Indirect subsidy/direct subsidy some students turned this question into a market failure question to say that the subsidy will help to achieve socially optimal level of output. Note that inequity is not a source of market failure. Also, the area of government expenditure is typically not identified in the diagram even when students say that subsidies are costly and incurs high opportunity costs.
- Generally weak evaluation where students simply concluded that the government needs to adopt a variety of measures to tackle affordability without justifying why. Many students did not look at the different yardsticks that determines "appropriateness" when comparing between policies.

#### Essay Q2

In Singapore, with the Covid-19 pandemic, many hawkers, especially those who are not digitally savvy are struggling to keep their stalls open, unlike their more social media savvy counterparts. In contrast, fast food restaurant chain McDonald's aggressively promoted its limited edition "BTS Meal" named after the South Korean boy band that endorsed it. McDonald's in the US also continued its "\$1 \$2 \$3 Dollar" discounted menu to lure bargain-conscious customers.

- (a) Explain how the different market structures in which hawker stalls and fast-food chain restaurants operate is likely to affect their profit levels in the long run. [10]
- (b) Discuss the differences in the strategies that a hawker stall and a fast-food chain restaurant can undertake to increase its profits. [15]

#### Part (a)

#### Introduction:

- Firms in different markets can make different levels of profits due to the different market structure in which they operate.
- The features of market structure is determined by four key characteristics, namely, the number and size of firms in the industry; the nature of the product; the ease of entry and exit of firms; and knowledge of the market.

#### Body:

- 1. Explain that fast food chain restaurants operate in an oligopolistic market while a hawker stall operates under monopolistic competition based on the characteristics of market structure
  - i) <u>Number and size of firm</u>
  - Few dominant / large firms (eg. McDonalds, KFC, Burger King) and there is a high market concentration ratio. Due to small number of firms dominating the market, there is large degree of mutual interdependence between firms, as the actions of one firm will significantly affect other firms' market share and profit levels, hence, firms consider the reactions of rivals to its price, nonprice and output decisions.

While

- Hawker stalls, on the other hand, exist in large numbers across the hawker industry, and there are many small hawker stalls operating along in various hawker centres or in small eateries all over the country.
- ii) <u>Entry barriers</u>
- Entry barriers in the fast food industry is relatively higher compared to hawker stalls.

#### → <u>Structural Barriers</u>

higher capital/ overhead or set up cost of renting or buying the physical space for the restaurant eg. A fastfood chain restaurant typically requires more space, resulting in significantly higher rental costs for their multiple outlets. Hence, their larger scale of operation enables the firm to better exploit significant IEOS and be more cost efficient that potential entrants which may deter entry of new firms as new potential entrants may not have such financial resources or find it difficult to procure the funding to enter the fast food industry as they are not be seen as credit worthy enough by banks providing business loans.

#### → <u>Strategic Barriers</u>

Fast food chain restaurants also spend more on large scale or extensive advertisements or on product innovation and marketing strategies to promote their brand image and gain/deepen customer loyalty and reduce the degree of substitutability of the food/service they provide.

#### → <u>Statutory Barriers</u>

Copyright/ Trademark on their logo/ brand/item (e.g MacDonald; KFC trademark logo) deters new firms from replicating the product and deters entry of new firms

Hence, given high BTE, potential entrants may not be able to generate sufficient revenue to cover their cost and earn at least normal profit to survive. This is because new/ potential firms operate on a smaller scale, hence the inability to reap significant IEOS and enjoy lower cost. Also, they may have to spend more on marketing campaigns and loyalty programs to incentivize consumers to switch to their service. As a result, potential entrants are deterred from entering the fastfood chain restaurant industry despite the presence of the high supernormal profits.

While

- BTE facing hawker stalls has relatively lower entry
  - → <u>structural barriers</u> (eg. rental of stalls) is relatively lower, hence easier to set up a hawker stall by renting a small space in a coffee shop or hawker centre.
  - → Legal barrier is relatively low as it includes mainly the license to operate the stall.

Hence, given the lower BTE, it is easier for new/potential firms attracted by the supernormal profits made by existing firms in the short run to enter this market.

#### iii) <u>Nature of Product</u>

- While both fast food restaurants and hawker stalls sell differentiated products (in terms of real or imaginary difference) → the scale / extent of differentiation is different.
- Fast food chain restaurants are differentiated in terms of the menu eg. type of food offerings, quality of the food they serve as well as in terms of conditions of sale eg. service standard, automated kiosks, collectible toys with MacDonald happy meals purchased.

While

• Hawker stalls are differentiated mainly in terms of the taste and recipes used by each hawker stall but the differentiation in product is slight.

#### iv) Knowledge of market

 There is imperfect knowledge in both the fast food chain restaurants et as well as the market for hawker stalls, although the extent differ and the degree of imperfect info is greater for fast food chain restaurants. Eg. degree of imperfect information in terms of methods/ techniques of production that includes presentation, product offerings and taste (eg. McDonald's' iconic 'Big Mac' compared to Burger King's' 'Whopper) as well as the degree of imperfect knowledge of pricing of products may be higher in a fast food chain restaurants given the greater degree of product differentiation compared to a hawker stall. 2. Explain that the different features of market structure enable the fast food chain restaurant to earn and retain supernormal profits while the hawker stall earns only normal profits in the long run.

#### Fast food chain restaurant chain can earn supernormal profit in the long run

- Due to the small number of large firms in the market and high BTE, each firm has significant market power (and high price setting ability) and captures a high market share and faces a high and price inelastic average revenue (AR) curve.
- Moreover, as each fast food restaurant chain has a large market share and is relatively larger in size, it is able to exploit internal economies of scale such as buying its raw material/ eg. ingredients or supplies in bulk, thus resulting in lower average cost. Hence, the firm is able to earn supernormal profits from its high average revenue and lower average cost.
- The high entry barriers mean that the fast food chain is able to continue earning supernormal profit in the long run as shown in Fig 1 below, where at the profit maximizing output where MC=MR, Q, P>AC and it earns supernormal profit shown by the area (P-AC) x Q.



While

#### A hawker can earn only normal profit in the long run

- As there are a large number of small hawker stalls in the market for hawker food, and due to the lower BTE and lesser degree of imperfect knowledge, each firm has a relatively small share of the market and face a downward sloping AR that is relatively price elastic (or lower price setting ability)
- While a hawker stall is able to earn supernormal profit [area P<sub>1</sub>bdC<sub>1</sub>] in the short run, it will attract more firms into the industry given the low entry barriers. The incumbent hawker stalls will thus see a fall in their demand, causing a leftward shift of the AR curve that becomes more price elastic as new firms enter the industry, until the firm makes only normal profit at the new profit maximizing output, Q2 where MR2=MC in the long run, as shown in Fig 2.

Price/Revenue/Cost



#### Conclusion:

Overall, fast food chain restaurants are able to make supernormal profits in the long run due to its higher market power and the higher entry barriers that exist in the market while a hawker stall only makes normal profits in the longrun due to the high degree of competition in a monopolistic competitive market where there is low barrier to entry and a large number of firms competing with one another.

#### Mark Scheme:

Knowledge, Application, Understanding, Analysis		
L1	<ul> <li>Answer is irrelevant in analysis <u>or</u> contains little economic <u>analysis</u> or contain a few relevant statements that are stated briefly/ superficially.</li> <li>Contains fundamental conceptual errors in analysis.</li> <li>➢ Contains very weak / vague explanation and did not explain how the differences in the market structure affects the type of profits made in the long run.</li> </ul>	1 – 4
L2	<ul> <li>An explanation 2 characteristics of the market structure with clear links to the respective industries but contain some gaps in analysis or inaccuracies.</li> <li>Demonstrates some general understanding of features of oligopoly and MPC and applies to context of the respective industries and shows some linkage made to the profits made in the LR</li> <li>Economic analysis is incomplete or lacks precision.</li> </ul>	5 - 7
L3	<ul> <li>Answer is rigorous and shows detailed economic analysis with the use of economic framework and clear link of both the hawker and fast food industry.</li> <li>Clear analytical structure to the answer.</li> <li>Good understanding and explanation of market structure and how it links to LR profits for the respective industries.</li> <li>Relevant and accurate use of economic concepts</li> <li>Good use of real-world examples to support the analysis</li> </ul>	8 - 10

#### Examiners' Comments:

- A significant number of students only stated the key features of barriers to entry without explaining how it can deter potential entrants in the context of the respective markets
- Explanation on the transition to normal profits in the long run was not clearly developed or explained in some of the student's answer.
- Weaker scripts merely listed the features of the respective market structures without linking to profits clearly.
- Some student associated the market structure of hawkers to a PC instead of a monopolistic competitive market, hence, erroneously explained the transition to long run profits using the PC firm and industry framework.
- Weaker responses chose to explain the strategies that can be adopted to increase profits in part (a), instead of firstly explaining how barriers to entry can deter (or allows) firms into the industry, hence influencing long run profits.
- Some students stated that hawkers earn only normal profits since they are not able to exploit internal economies of scale, while fast food chains are able to earn supernormal profits because they are able to exploit internal economies of scale. This does not clearly answer the question as to how the characteristics determine the type of profits made by the hawkers and fast food chains in the long-run.
- Some answers were purely theoretical without any clear reference made to the context of hawker or fast food chain restaurant market structure.
- A number of students attempted to combine the diagrammatic analysis for hawkers and fast-food chains and the type of profits made in the long run which is conceptually inaccurate since the cost structure differs for firms operating in these two different market structures.
- A number of students wrote hawkers do not have any price setting ability and are price takers as they operate in a monopolistically competitive market structure which is inaccurate. Firms operating in a MPC market structure can set prices but have limited ability to do, and hence are considered price setters.

#### Part (b)

#### Introduction:

- Strategies adopted by both type of firms can include strategies to increase revenue (via price and non price strategies) and/ or reduce cost to increase profits
  - Apply to context: amidst the challenges brought about by the Covid-19 pandemic where reduced traffic flow, income and purchasing power may have to a fall in demand and in turn revenue for the firms → fall in profits of firms, ceteris paribus.
- However, the type and extent of strategies undertaken by hawker stall and a fast food chain for both revenue and cost strategies can differ.
- Firms are assumed to be profit maximising where they produce until the output level where MC=MR.

#### Body:

#### A) Revenue increasing strategies

1. Price competition/ pricing strategies:

### Fast food chain restaurant can undertake price competition to increase profits unlike hawkers stalls that exist in a monopolistic competitive market structure.

• Limit pricing / predatory pricing/ price wars → Limit pricing as seen in Figure 3 below can be taken by fast food to manage to deter the entrance of potential firms or undercut existing rivals in oligopolistic markets for fear of losing market share. In addition, the possibility of price wars also raises barriers to entry. The fast food industry in Sg consist of mainly of few large firms such as McDonalds, KFC, Burger King and Subways dominating the fast food industry in Singapore. For eg. Fast food chain restaurants can engage in limit pricing (where price is set below profit maximising price) through their introduction of value dollar meals, McDonalds' \$1 ice cream cone or 1 \$2 \$3 Dollar" discounted meals. Fast food chain restaurants have significant market share relative to a hawker stall and are able to enjoy benefits of internal economics of scale and lower their average cost. There is considerable excess capacity in the fast food industry (relative to the hawker industry) and price competition are likely to be initiated by firms with the largest minimum efficient scale. They are also able to draw on their past profits to survive.



- In Figure 3 above, the firm decides to sacrifice some short-term profits by pricing lower at P2 and sell a higher output at Q2 to increase its market share. Hence, fast food chain restaurants can engage in limit pricing and sacrifice its SR profits by charging a lower price.
- However, given the firms' mutual interdependence, when a dominant firm, McDonalds reduces its
  price, other fast food chain firms such as KFC will follow for fear of losing market share and that
  the demand for their product and in turn total revenue and profits will fall significantly if they don't.
  This ultimately results in price wars and firms that cannot match the low price and make at least
  normal profits will exit the industry leaving the incumbent with greater market share and higher
  price setting ability to increase price and profits.
- In addition, this pricing strategy may help keep out new entrants as the latter may lack sufficient internal economies of scale to produce at similar costs and charge the same low price when maximising profits. A new entrant, having a smaller market share, cannot match the lower price offered by the incumbent larger firm and may incur a loss and shut down. The incumbent firm has driven out its competitor and subsequently raises prices to increase total revenue and profits in the LR.

On the other hand,

- Price competition among monopolistic competitive firms such as hawker stalls is very low. The incentive to undercut competitors or engage in price wars as impact on other firms is insignificant given the many firms in the industry. Hawker stall or even small-scale restaurants sell differentiated products hence, the products sold by one firm are similar but not identical eg. different taste and presentation and ingredients used by one chicken rice stall may differ to that those sold by its competitors.
- Due to product differentiation, the hawker firm has some degree of market power and is able to charge more than its competitors without necessarily losing all its customers because there are some customers who would still prefer its products as it better suits their preferences. Hence, this enables them to engage in independent pricing strategy instead of price competition. MPC firms

like hawker stalls are relatively independent in their price and output decisions and do not engage in price competition

• In addition, monopolistic competitive firms like hawker stalls make only normal profits in the long run due to low barriers to entry. Therefore, even when increased competition, they are unlikely to engage in price competition as it would reduce their demand / AR and cause them to make subnormal profit.

#### Evaluation:

- However, even for oligopolistic firms, this pricing strategy (limit or predatory pricing) is not always sustainable (and is typically only observed in the SR) since it can lead to losses or lower profits for the firm, and it depends on whether the incumbent will survive the price war if the lower prices are matched by competitors. (For example, when rival firms retaliate to maintain market share, the firm that initiates the price cuts may not gain significant market share but instead, its total revenue will be lower because its price will be lower without any significant increase in sales volume. This can result in lower profits or even subnormal profits for all firms in the SR.
- Firms that incur subnormal profits in the long run will have to shut down and leave the industry. Hence, price wars are very risky as the duration of the price war can be very uncertain. A lot of risks and uncertainty are involved because firms have incomplete information about the intentions of others. Hence, whether the firm successfully drive out its competitor would depend on its ability to tap on past funds/ supernormal profits.
- 2. Non price strategies:

### While both firms undertake non price strategies to increase profits, the scale and type of non-price strategies differ.

Due to mutual interdependence and in view of the uncertainty of rivals' behaviour, firms in an oligopoly may prefer the use of non-pricing strategies to differentiate their products to minimize the risk of price wars. Fast food chain restaurants may prefer to compete via non price methods of competition instead of prices and adopt non-price strategies such as branding, R&D, and large-scale advertising to increase total revenue and profits.

(i) <u>Advertising; branding and endorsements; collaboration:</u>

McDonalds may promote its brand through advertising or sponsoring major events or endorsement and collaboration with artistes, increasing its brand presence and customer base, thus increasing its demand. Hence, fast food chain restaurants may implement persuasive advertising and engage in more costly forms of advertisements, like having celebrity endorsements eg.McDonald's using Korean boy band BTS to endorse selected McDonalds product eg BTS meal or or Pokeman x McDonald's collaboration placing large and prominent advertisements on billboards, newspapers, and websites and advertising frequently on television. Also, by carrying out limited time bound promotion/ limited time deals to target consumers' aversion to loss, it leads to consumers buying such items and increasing the demand for such products.

Fast food chain restautants also have the ability to carry out such extensive advertising or promotion since they have very large output to spread out such high advertising costs unlike monopolistic competitive firms, which have considerably lower levels of output. Fast food chain restaurants which are oligopolistic by nature may set up many advertisements to attract consumers and create loyalty as its aim is to persuade consumers that a its brand is different and superior to other brands therefore, demand for the firm's product becomes more price inelastic. This increases the price setting ability of the firm and enables it to increase total revenue and profits by raising prices, as illustrated in Figure 3. Such non-price strategies lead to an increase in awareness and an increase in brand loyalty, which in turn lead to an increase in demand and reduction in substitutability for their products.

#### (ii) <u>R&D/ Innovation:</u>

Fast food chain restaurants existing in the oligopoly market structure can make and retain supernormal profits in the long run due to high barriers to entry. They have the ability to invest in R&D to improve their product (i.e product innovation), which increases demand for their products and hence, total revenue, enabling the firm to earn more profits. In the case of the fast food chain restaurants, it could mean coming up with new recipes and creating a new flavour eg. Hershey's chocolate sundae or product range that are unique so as to attract more customers to the restaurant via product innovation. Or the firms may market their products more effectively (and reach a wider target audience) through the development of apps.

#### (ii) <u>Targeted marketing</u>

Fast food restaurants make use of visual devices that creates another cue to drive attention to the items they want to make a focus of. Eg. MacDonalds engages in marketing and promotion of their <u>new</u> Signature meals / Seasonal products which are regularly updated and showcased via their digital screen media. In this way, MacDonald's plays with the scale and salience of specific target items to shift the perceived norms/ defaults of ordering by consumers eg. consumers ordering signature meals away from the typical extra value meals.

#### Analysis:

- As seen from figure 4, such non-price strategies will increase demand for the firm's product. At the same time, they also make the demand curve of the firm's product more price-inelastic, thus allowing the firm to increase its price without losing significant market share. At the new profit maximising output, Q2, profit increases to (P2-C2) x Q2
- In addition, the reduction in substitutability of the firm's product will lead to a fall in the value of the cross elasticity of demand for the firm's product. This will cushion the fall in the demand for the firm's product and in turn its total revenue and hence profits when the price of its rival's product falls.
- Oligopoly firms have high ability to compete based on non-price strategies because they are able to retain supernormal profits in the long run due to high barriers to entry.



Price/Revenue/Cost

#### Evaluation:

• Costly: However, constantly innovating newer products and/or spending on advertisement can be expensive, therefore increasing the total costs incurred by firms and overall effect on profits may not nnecessarily increase much. Therefore, firms should consider whether the increase in revenue from

pricing strategies would outweigh the increase in costs required to engage in the chosen strategy, especially if results are not necessarily guaranteed and takes a long time.

On the other hand,

the extent of non-price competition undertaken by hawker stalls are of a smaller scale.

i) <u>Small scale advertising:</u>

Since monopolistic competitive firms such as hawker stalls make only normal profits in the long run due to due to low barriers to entry, they have less ability to do research and development or advertise compared with oligopolistic firms. MPC firms such as hawker stalls adopt mainly small-scale product differentiation and advertising on a smaller scale to increase profits. While the firms sell differentiated products and have some degree of monopoly power, they engage in non-price strategies which are of a lower scale eg. advertising through social media platform which incur relatively lower cost. Their scale of advertising is lower since their ability to spread the sunk cost of advertising over a larger range output is limited and hence incur higher cost with large scale advertising.

- ii) Adoption of technology instead of intensive R&D:
  - The smaller hawker stalls may choose to increase their consumer base and revenue by partnering with food delivery companies such as Food Panda and Grab through adoption of technology (eg. social media and delivery apps) and not just rely on dining in as the only source of income but expand its services to delivery online and takeaway. This allows them to increase customer base (eg. To consumers who order online) as they expand beyond their physical shop space and increase their demand.
  - To facilitate takeaway and delivery online, many of these food establishments may also invest in digital marketing to create online stores with more convenient payment mode or uses social media e.g. Instagram to reach out to bigger and newer segment of customer bases (e.g. younger customers) rather than the usual working crowd.

# Can also include product differentiation and explain how the type and extent of product differentiation is more imaginary or based on service/ conditions of sale than real for hawkers relative to fast food eg. Packaging compared to product innovation that can be undertaken more easily for fast food chain restaurants and hinging on customer relationship to increase demand.

#### Analysis:

- These strategies help to increase their AR and make their demand more price inelastic, hence, giving them more price setting ability and higher revenue and profits.
- They are also unlikely to engage in extensive marketing campaigns as it would increase AC and lead to subnormal profits since they make only normal profits in the long run

#### Evaluation:

- Relative to the fast food chain restaurants, the increase in AR and in turn profits may be slight given their smaller scale of non price strategies.
- The ability for hawkers to undertake the above strategies may limited given the lack of entrepreneurial skills, digital skills and innovation that need time to develop and may not be available for the firms at all. Moreover, these strategies may not be successful at all especially with older hawkers. Hence, the firms' strategies may not be enough to increase demand and revenue.
- Increase in cost (eg. payment to service providers) that may reduce the overall profits of the firms.

#### B) Cost reducing strategies

#### (Type) of Strategies to reducing cost differ between hawker stalls and fast food chain restaurants

 Increased flexibility to implement cost cutting measures and reduce variable cost To increase profits, hawker stalls may reduce their labour costs by reducing the number of staff e.g. wait staff or sourcing for cheaper raw materials and reduce their raw materials costs. These small firms have more discretionary and flexibility (absence of trade unions and workplace representations) to implement cost cutting measures compared to large oligopolistic firms like fast food chain restaurants

For eg. to reduce cost, firms can change their ingredient supplier to incur lower costs which would help to reduce both AC and MC in the long run.

ii) Banding

Hawker stall owners may group buy to gain the advantages of bulk buying in sourcing for raw materials eg. ingredients such as eggs so as to reduce per unit cost of production for each firm  $\rightarrow$  This allows them to reduce their unit cost of production as they gain the advantages of bulk buying such as marketing IEOS enjoyed by the larger firms such as the large fast food chain restaurants, while still retaining their independence.



#### Analysis:

With reference to figure 5 above, at the original  $MC_0$  and  $AC_0$ , the profit maximisation price and output where  $MC_0 = MR$  were  $P_0$  and  $Q_0$  respectively. At  $P_0$  and  $Q_0$ , the supernormal profit is given by area (( $P_0 - AC_0$ ) x  $Q_0$ . With the strategies to reduce cost, the MC and AC decrease from  $MC_0$  and  $AC_0$  to  $MC_1$  and  $AC_1$ . The profit maximisation price and output where  $MC_1 = MR$  then becomes  $P_1$  and  $Q_1$  respectively. At  $P_1$  and  $Q_1$ , the supernormal profit is now the larger area given by ( $P_1 - AC_1$ ) x  $Q_1$ .

#### Evaluation:

• In the case of hawkers, they should be mindful if such cost cutting measures lead to a fall in the quality of the good /services that may adversely affect the demand for a firm's product in the longer run. For example, quality of the food may fall due to the change in ingredients. In turn, this may have the unintended consequence of reducing demand / AR for the firms' product in the long run and profits may fall further if the total revenue falls more than the potential cost reductions.

On the other hand, for oligopolistic fast food chain restaurants, cost cutting measures include:

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[Turn Over

i) <u>Process innovation</u>

Oligopolistic firms like fast food chain restaurants may use R&D (process innovation) to reduce cost due to their ability to make LR supernormal profit  $\rightarrow$  adopt most cost efficient methods of production to reduce unit cop  $\rightarrow$  fall in AC and MC as shown in Figure 5.

Eg. Introduction of self-service ordering kiosks which may overall lower average cost due to increased efficiency, increasing profits or innovate to reduce waste such as having minimum packaging in their production process. Fast food chain restaurants may invest in R&D using robots or self-ordering kiosks to increase efficiency in the production line to replace labour and speed up the process of producing the meals.

For instance, for McDonalds, ordering via the self-ordering kiosks eliminates the cost of front-line service staff. This reduces the need for human labour in the process, reduces errors and increases the productivity of the job process. This helps to lower AC and MC from AC0 to AC1 and MC0 to MC1.

#### ii) <u>Vertical integration: Backward integration</u>

Fast food chain restaurants can also engage in vertical integration to reduce cost eg. cost of ingredients and in turn increase profits. Fast food chain restaurant can acquire and increase ownership over companies that were once its suppliers. The main objective is to gain greater control over the quantity and quality of scarce factors of production such as the potatoes needed to produce the fries, or the beef needed to produce the beef patties and greater security with regards to their delivery.

Eg. given its supernormal profits and high bargaining power, McDonald's can seek to establish factories to process its own meat, grows its own potatoes, and transports its own materials, saving on transport cost. By taking full control of the component and distribution elements of the supply chain, the company delivers products to its restaurants at a lower cost  $\rightarrow$  fall in AC and MC as shown in Figure 5

#### Conclusion and Overall Evaluation:

- Overall, the strategies adopted by a fast food chain restaurant may <u>differ</u> from those of a hawker stall due to their different market structures and their level of profits made in the long run.
- In addition, occasionally, given uncertainty in the behaviour of oligopolies, some fast food chain
  restaurants may choose to avoid competition and collude tacitly, eg. KFC and JolliBee may offer similar
  products, at similar prices for products that offer product homogeneity eg. KFC 2 piece meal and
  Jollibee 2 piece chicken with 2 sides meals, hence, differing in terms of pricing strategies that is adopted
  by MPC firms. However, this deviates away from the objective of profit maximisation for the followers
  as these firms coordinate their production and pricing strategies indirectly by observing the output and
  pricing decisions of the leader.
- Also, given only normal profits made in the long run, hawkers may prefer strategies to reduce cost relative to the larger fastfood chain restaurants who have greater ability to adopt strategies to increase revenue.
- <u>Alternatively</u>, while the differences in their market structure characteristics may result in differences in the type of strategies adopted in terms of <u>type</u>, <u>scale and extent</u>, in terms of price competition, even oligopolies such as fast food restaurants ability to engage in pricing competition may be limited to the short run given potential losses that they may have to incur. Also, as the non-price strategies undertaken by both hawkers and fast food chain restaurants may increase cost, thus affecting overall profits, both type of firms will actively adopt strategies that target consumer's cognitive bias effectively and minimise falling victim to the sunk cost fallacy where only cost increase. Hence, oligopolies such as fast food chain restaurants (that are typically observed to behave more competitively than collusively) have a greater tendency to compete more on non-price strategies than price which do not differ much from monopolistic competitive market structures where hawker stalls exist in the long run.

#### Mark Scheme:

Knowledge, Application, Understanding, Analysis		
L1	<ul> <li>Unclear and/or inaccurate economic analysis.</li> <li>Little / non-existent use of economic theory / framework in the explanation.</li> <li>A descriptive answer with glaring conceptual error</li> <li>Mere listing of strategies with little attempt to show comparison</li> </ul>	1-4
L2	<ul> <li>Economic analysis is incomplete or lacks precision.</li> <li>Some / insufficient economic analysis of the differences in strategies adopted by hawker stalls vs fast food chain restaurants.</li> <li>Some conceptual gaps in analysis</li> <li>Answers are not contrasted/ compared according to the differences in terms of the type or extent but merely listed according to the strategies adopted by hawker stalls and for fast food chain restaurants</li> <li>Relevant diagrams are used but might not be accurately explained or applied to support economic analysis.</li> </ul>	5-7
L3	<ul> <li>A well developed and clear economic analysis of the differences in strategies adopted by both hawker stalls and fast food chain restaurants</li> <li>rigorous and detailed economic analysis with the use of economic framework and shows contrast in terms of the strategies adopted by hawker stalls as compared to fast food chain restaurants.</li> <li>Good use of examples is made to the context of hawker stalls and fast food chain restaurants</li> <li>Good structure of answer that show the differences in strategies adopted in terms of the different methods of competition.</li> <li>Thorough explanation of 3 strategies across price and non- price methods of competition and cost reducing strategies</li> </ul>	8 - 10
	Evaluation	
E1	<ul> <li>An unexplained judgement</li> <li>An unexplained evaluative conclusion/comment</li> </ul>	1 – 2
E2	<ul> <li>Some evaluative assessment supported by economic analysis</li> <li>Evaluation or comment(s) may not be well-explained, may be unclear and/or may be inaccurate at times.</li> </ul>	3 - 4
E3	<ul> <li>A good evaluative assessment supported by economic analysis and able to give in depth or well explained insights.</li> <li>A synthesis of earlier economic arguments to arrive at relevant judgements/decisions (i.e. answer the question).</li> <li>Well-explained evaluative comments supported by accurate and clear analysis</li> </ul>	5

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#### Examiner's comments:

- Weaker scripts did not show a comparison of strategies between both types of firms but instead listed and explained the strategies that the respective firms operating in a MPC and Oligopoly market structure can adopt.
- Use of relevant examples to explain and substantiate the different strategies that the respective firms can adopts are not clearly applied or developed.

- A number of students explained the strategies for hawkers or fast-food chains and in their attempt to differentiate the strategies, they would simply state that the other cannot or do not undertake such a strategy instead of going on to explain a strategy that could be used by the firm. For example, fast food chains can reduce average cost by engaging in process innovation. However, hawkers cannot since they do not enjoy supernormal profits.
- Strategies highlighted are not clearly substantiated using relevant framework or unexplained but loosely stated and linked to revenue and profits. Use of relevant economic framework depicting profit maximizing output, changes in revenue/ cost and in turn profit not developed in answer analysis, or made referenced to in the explanation of answer.
- While price discrimination was mentioned as a strategy by some students, the attempt to show how the strategy differ between both firms were lacking or not substantiated clearly, hence making it a relatively vague explanation as a difference in pricing strategy.
- A large number of students explained how predatory/limit pricing works but failed to link it to how it allows the incumbent firms to enjoy higher profits using a relevant economic framework.
- Some students stated loosely that banding allows smaller firms to exploit financial and technical economies of scale which is conceptually inaccurate since these hawkers still retain their independence. Moreover, banding together to purchase factor inputs does not reflect a change in the scale of production for the hawkers and hence a movement along the LRAC. They should be more precise in their explanation of the benefits they derive from banding.
- A number of students were not able to differentiate between the strategies that entail differentiating the product from the rivals and simply advertising. They used the strategies interchangeably. Students did not explain why advertising will lead to an increase in AR facing a fast-food chain as well as reduce the degree o substitutability of the product. A rigorous answer demonstrated application to cognitive biases to explain why advertising will increase profits.
- A handful of students used abbreviations for example, pdt, mkt, rev, p, and many others as well as notations that they think is universally understood. Furthermore, they simply wrote in point form consistently throughout the essay.
- For evaluation, a majority of students simply summarized the strategies again and stated why they are different without adding any further value.

#### Essay Q3

Discarded plastics leach into the water degrading the water quality with toxic compounds and end up harming human and animal health. The Green Rewards scheme, which offers customers a 10cent rebate when they bring their own bags to shop at FairPrice stores, is set to end on 1 August 2018. While there has been an increase in the number of plastic bags saved, progress has plateaued out.

- (a) Explain why the consumption of single-use plastic bags might lead to unintended consequences on society. [10]
- (b) Discuss whether government intervention is better than efforts by individual supermarkets to manage the problem of single-use plastic bags. [15]

#### Part (a)

#### Introduction:

- In a free market, economic agents act based on their self-interest e.g. consumers maximise their utility and firms maximise profits. In the case of single-use plastic bags, the decisions of consumers might lead to unintended consequences on themselves and to third-parties.
- Unintended consequences are undesirable outcomes that are not part of the economic agents' objective in decision-making.

#### Body: Explain the unintended consequences with use of economics framework

- 1. Unintended effects on the consumers of single use plastic bags. (Imperfect info argument)
- In the market for single-use plastic bags, the consumers of single-use plastic bags could be the firms e.g. supermarkets, provision shops or individuals in households. They are willing and able to consume plastic bags based on their perceived marginal private benefits, which is given by D<sub>1</sub>.
- However, the plastic bags that are not properly discarded end up as waste in waterbodies and contaminating them. Ingestion of contaminated water due to chemical leaching or consuming fish with microplastics in results in <u>poor health outcomes</u>, e.g. sicknesses in the longer term, and thus greater expenditure on healthcare. This is an <u>unintended consequence</u> on the <u>consumers of plastic bags</u> due to imperfect information as these costs are usually not visible in the short run and occur only in the longer run. Hence the actual MPB, D<sub>2</sub> is lower than the perceived MPB, D<sub>1</sub>.
- The free market equilibrium, Q<sub>e</sub>, is where S<sub>1</sub>=D<sub>1</sub>, whereas the allocatively efficient level is at Q<sub>s</sub> where S<sub>1</sub>=D<sub>2</sub>. Hence there is an overconsumption of Q<sub>e</sub>-Q<sub>s</sub>, which results in a deadweight loss since, for every unit of plastic bags that is over-consumed, the total actual benefit to society < total cost to society. Price/benefits/costs</li>



- Due to self-interest, consumers of single-use plastic bags only consider their marginal private benefits e.g. supermarket/provision shops offers better customer service and convenience to their customers to bag their products (and hence higher DD for the supermkts' products), to individuals: the convenience of carrying their goods from place to place, or other uses at home.
- However, the improper discarded plastic bags cause damages to third parties who are not consumers and producers of plastic bags e.g. decline in fishery harvests due to water contamination (loss of profits), loss of marine biodiversity due to degradation of marine habitats, water pollution (rising healthcare costs) etc. Hence, the costs or loss in benefit to third parties (-MEB) is an unintended consequence of self-interested decision making and results in MSB<MSC.</li>
- Assuming no negative externalities in production of plastic bags, MPC = MSC, where MPC (=MSC) is the cost incurred by producers of plastic bags e.g. cost of raw materials, cost of labour, distribution costs etc.
- The free-market equilibrium Qe occurs where MPC=MPB given self-interest of consumers and producers, whereas the socially optimal level is where MSC=MSB at Qs.
- This overconsumption of Qe-Qs results in a deadweight loss of ABC → for output that is over-consumed, total social benefit between exceeds total social cost, resulting in net loss of welfare.





- The allocative inefficiency arising from both imperfect information and negative externalities is an unintended consequence to the government which needs to intervene to improve the allocation of resources to maximise the welfare of society.

#### Conclusion:

- The consumption of plastic bags and improper disposal of it has led to unintended consequences to consumers, third parties and the government. There are various ways that can be undertaken to reduce these unintended consequences.

Mark Scheme:

	Knowledge, Application, Understanding, Analysis	
L1	<ul> <li>A descriptive response</li> </ul>	1 – 4
	<ul> <li>Glaring conceptual errors</li> </ul>	
	<ul> <li>No analysis on the market for single-use plastic bags</li> </ul>	
L2	<ul> <li>Underdeveloped explanation of sources of market failure.</li> </ul>	5 - 7
	<ul> <li>Analysis lacks relevant details</li> </ul>	
	<ul> <li>Application to the context of single use plastic bags is weak</li> </ul>	
	- Lacking scope of analysis (Analysed only negative externality or	
	imperfect information)	
	<ul> <li>No linkage made to unintended consequences</li> </ul>	
L3	<ul> <li>Good analysis of market failure from both sources.</li> </ul>	8 - 10
	<ul> <li>Detailed explanation linking to unintended consequences.</li> </ul>	
	<ul> <li>Well applied to the context of plastic bag consumption</li> </ul>	

#### Examiners' Comments:

- Question 3 was the most popular question and part (a) of the question was done well by most students. Those who scored at least high L2 marks were able to explain 2 unintended consequences / 2 sources of market failure with use of economics framework and application to the context of plastic bags. While most students are familiar with the market failure analysis, there were gaps in analysis that prevented students from getting L3 marks. Also, far too many students did not directly address the key words "unintended consequences" and simply used the term in the introduction or in the conclusion, while others did not even address the term.
- Lack of scope of explanation:
  - There were a small number who explained both production and consumption externalities and ignored imperfect information in their answer. As such, the students only explained unintended consequences on third parties and lacked scope.
  - There were also a minority of students who gave unconvincing explanation of other sources of market failure such as asymmetric information and market dominance – these sources were not accepted.
- Lack of application to the context:
  - Good answers were able to state what determines MPB or MPC of plastic bags while weak responses did not apply it to the given context.
  - The third parties were not clearly identified in the explanation of the negative externality. These might be the fishermen, the taxpayers, those who depend on the water source etc who are not the consumers of single-use plastic bags. There were also students who stopped at saying discarded plastic causes water to be contaminated, without further elaboration on the costs of polluted water or the lack of biodiversity and destruction of the environment.
- Insufficient depth of elaboration:
  - Some answers lacked details regarding how the market equilibrium and socially optimal quantity are derived, simply stating that there is overconsumption in the market due to the externality.
  - Some answers simply stated the area of the deadweight loss without elaborating what that area represented or how it was derived.
- Conceptual errors: the most common and serious error that was made by far too many students
  was that they associated imperfect information problem with how consumers are unaware about
  the negative externalities rather than lack of information about the costs to consumers themselves.
  These responses erroneously used the lack of awareness of 3<sup>rd</sup> party costs to explain why actual

MPB < then the perceived MPB. Students should note that 3<sup>rd</sup> party costs are IGNORED due to self-interest, and not because consumers lack perfect information. They should also note that imperfect information argument is always about the lack of awareness about consumers' own private benefits/cost.

#### Part (b)

#### Introduction

- The government's objective to maximise social welfare. The supermarket's objective on the other hand is to maximise profit. Both supermarkets and the government can adopt measures to resolve the problems mentioned in part (a) and both approaches have their limitations.

#### Body: Discuss the measures that governments and firms can adopt to manage the problems

#### Thesis: Government intervention is better – Indirect tax on plastic bags

- Unlike a supermarket, government is not restricted by the profit motive and can implement measures such as indirect taxes, which *leverage on consumers' loss aversion* to correct for market failure.

#### Measure 1: Explain how the indirect tax works.

- Set indirect tax = -MEB of plastic bags
- Increase MPC/decrease  $\overrightarrow{S} \rightarrow up$  to  $\overrightarrow{MPC_2} \rightarrow \overrightarrow{S}$  shortage at  $P_1 \rightarrow upward pressure on the price.$
- Increase in price to  $P_2 \rightarrow$  fall in qty demanded to  $Q_s \rightarrow$  DWL is eliminated.
- Application: supermarkets and provision shops will give out less plastic bags to consumers as the prices of plastic bags increases and thus costs incurred by them increases.



Figure 3

#### Anti-thesis: Limitations of government measures → firms' measures may be better

- Ineffectiveness in correcting market failure / Government failure
  - Imperfect information on MEC of plastic bag use since the damage to the environment e.g. water pollution cannot be easily quantified. Over taxation might lead to underconsumption of

single-use plastic bags which is allocatively inefficient. If the -MEB is overvalued e.g. due pressure from lobby groups, the extent of allocative efficiency resulting from underconsumption might outweigh the initial welfare loss from overconsumption resulting in government failure.

#### Other acceptable measures by the government include:

- <u>Legislation and regulation</u> such as <u>ban on single use plastic bags</u> in supermarkets/provision shops, or <u>compulsory charge</u> on plastic bags.
  - This will lead to fall in demand of plastic bags by consumers (if assume that supermarkets/provision shops are not the only consumers of plastic bags) → fall in MPB → new market equilibrium will be where new MPB = MPC → Qs → reduce the problems/solve market failure.
  - Alternatively, students may analyse a complete ban on use of plastic bags in the country  $\rightarrow$  output = 0.
  - **AT:** However, penalties must be harsh enough and there are high monitoring costs to ensure the ban is effective, and a complete ban may result in government failure as single use plastic bags are desirable to society as well.
- <u>Education and campaigns</u> to raise awareness on how use of plastic bags could be damaging to the environment and harm the individuals' own health.
  - Through various platforms such as ads on newspapers, TV, social media, and schools and campaign slogans/mascots- <u>salient</u> images of marine creatures suffocating under the sea or images of sick people who consumed contaminated water could influence tastes and preferences of consumers, and even make consumers consider effects on 3<sup>rd</sup> party costs as part of own benefits as they become more environmentally and socially conscious.
  - This will cause demand for plastic bags to fall to D₂ (perfect information) in Fig 1 and Qs to be attained → reduce problems / solve market failure.
  - Alternatively, there can be greater awareness made to proper disposal of plastic bags → this could reduce the -MEB/MEC due to improper disposal → less waste in waterbodies, less contamination, less microplastics found in fishes → increase the socially optimal level of plastic bags → reduce extent of market failure.
  - **AT:** However, it takes time for habits and tastes and preferences to change and in the shortterm, the campaign might have no visible impact on the demand for plastic bags if consumers value convenience more. Also, the effectiveness could depend on the scale and quality of the campaign – scale, outreach and quality could be affected by the costs and people's receptiveness due to campaign fatigue.
  - Note: it is equally acceptable for students to suggest education/campaigns under firms' measures. However, you may want to think through whether it makes more sense for the government or the firm to undertake this measure.

#### Anti-thesis: Efforts by supermarkets are better

Firms may have incentive to manage the problems of single use plastic bags. If the supermarket's objective is to maximize profits, when consumers use less plastic bags, firms will need to incur lower cost of plastic bags as these are typically given free of charge to consumers of groceries. They may have a corporate social responsibility (CSR) to manage environmental problems caused by single-use plastic bags. CSR is a form of production differentiation. It is advantageous for a supermarket to be seen as environmentally responsible in its business as this is a way for them to increase their total revenue and profits OR they could have profit-satisficing objective – profits and care for the environment.

#### Measure 2: Explain how a 10 cent rebate (subsidy) works

- The 10-cent rebate under the green rewards scheme will incentivise consumers to bring their own reusable bags e.g., a canvas bag, as it reduces the overall price of groceries paid by consumers.
- This means NTUC will indent fewer single-use plastic bags from its supplier since many of their customers would have brought their own. In the market for single-use plastic bags, given that

supermarkets are consumers of plastic bags, there would be a fall in demand from  $D_1$  to  $D_2 \rightarrow MPB_1$  shifts left to  $MPB_2 \rightarrow Qs$  is achieved and the DWL is eliminated  $\rightarrow$  reduce problems / solve market failure.



Figure 4: Market for single-use plastic bags

#### Thesis: Limitations of firms' measure → government measures may be better

- Depending on the amount of the rebate/subsidy, it may not be significant enough to reduce the demand for single-use plastic bags. E.g. in the context of Singapore, 10 cents is a small proportion of income of most Singaporeans or a small proportion of the total price of groceries – it is hence unlikely for consumers to be incentivized to bring their own bags. Or the valuation of the benefits of the plastic bag exceeds 10c → Hence Qs is not achieved and there remains an overconsumption of single-use plastic bags.
- Supermarkets may also be reluctant to give higher rebates to increase its effectiveness 
   → The higher
   the rebate/subsidy, the lower the firm's profit. Also, a supermarket is less willing to take painful actions
   that will hurt consumer demand and its sales revenue. If an individual firm makes the consumer pay 10
   cents or more for plastic bags, and this is not done universally in all supermarkets, consumers will
   switch to another supermarket.
- EV: The rebate/ subsidy is a softer and less effective measure than a tax by the government and does not play on consumers loss aversion. It is also less effective than a legally binding measure like legislation e.g. a ban on single-use plastic bags.
- Unintended consequences: if 10c charge is imposed on each transaction rather than each plastic bag (which seems to be the case in Singapore), consumers may use more plastic bags than necessary since they have "paid" for it e.g. double-bagging.

#### Other acceptable measures by individual supermarkets includes:

- Education and campaigns (as explained earlier)
- Supermarkets do not give plastic bags (on their own accord) and more prominent placement of reusable bags for sale → reduce the demand in the market for plastic bags → quantity falls to Qs → reduce the problems / solve market failure.

#### Conclusion and Overall Evaluation:

Overall Judgement: Must choose which approach is better - government intervention or efforts by supermarkets.

- Government intervention is better:
  - Objective of the government is to maximise society's welfare while individual supermarkets which are profit motivated → there is more incentive for the government to carry out measures to reduce the problems of single-use plastic bags compared to the firms. Thus, the government is more willing to take strong action to regulate the use of plastic bags through various policies vs the firms, whose bottom line could be affected by these measures.
  - Government measures could be more effective given the <u>scale</u> of the measures e.g. tax on plastic bags affects prices of plastic bags in the country and will affect not just the supermarkets but provision shops, hawker stalls, retail stores etc. Likewise with ban on single use plastic bags. While measures by individual supermarkets will simply impact the demand for plastic bags in and by supermarkets, and may not be sufficient to reduce the problems.
  - Government measures such as education and campaigns / legislation may be more sustainable and thus more effective over the longer run as the government has more resources (tax revenue/reserves) than the individual supermarkets (past accumulated profits).
  - Comparison of policies by government vs individual supermarkets:
    - Based on loss aversion, it seems like the tax or compulsory charge by the government is a better policy than a rebate of the same amount by firms in discouraging plastic bag use.
    - Education and campaigns by the government target the problem of info failure and can influence taste/preferences over the long term → lasting permanent effects, while rebates by firms may only work as long as the rebate is given.
    - Legislation such as ban has greater certainty in outcomes as compared to rebates by firms which is dependent on consumers' income, valuation of their benefits etc.
- Efforts by supermarkets is better (less convincing): they have better knowledge of the market, the tastes and preferences of consumers and are better able to develop cost-effective solutions to the problem of single-use plastic bags.
- Overall: Given that firms only act if it is in their interest to do so, efforts by individual supermarkets could be seen as tokenism or greenwashing. There is also evidence in the preamble which stated that progress in reducing single-use plastic bags through the green reward scheme had plateaued out. Therefore, government intervention will be better than efforts by individual supermarkets to manage the problem of single-use plastic bags.
- Any other insightful points will be accepted.

#### Mark Scheme:

Knowledge, Application, Understanding, Analysis		
L1	A few valid points.	1–4
	Answer mostly irrelevant or inaccurate.	
	Shows some knowledge.	
	<ul> <li>No analysis on the market for single-use plastic bags.</li> </ul>	
	<ul> <li>Meaning of question not properly grasped.</li> </ul>	
	<ul> <li>Inadequately explained or descriptive.</li> </ul>	
L2	Gaps in the analysis of government intervention or efforts by	5-7
	supermarkets in managing single-use plastic bags.	
	<ul> <li>Only analysed measures by the government but not the supermarket.</li> </ul>	
	<ul> <li>Some policies were one-sided/No limitations</li> </ul>	
L3	• Excellent diagrammatic analysis on how market failure is resolved in the	8-10
	market for single-use plastic bags.	

	<ul> <li>Good scope – at least <u>2</u> policies well discussed i.e., one by individual firms and one other policy adopted by the government.</li> <li>Good application to the context.</li> </ul>	
Evaluation		
E1	A superficial conclusion /assertion.	1 - 2
E2	<ul> <li>Substantiated evaluative comments about the relative advantages of either party.</li> </ul>	3 – 4
E3	<ul> <li>Insightful and perceptive judgement on which party is better able to resolve the issues based on 2 well explained insights.</li> </ul>	5

#### Examiners' Comments:

- Most students were able to discuss at least 2 measures that the government and individual supermarkets can undertake and showed sufficient scope in discussion. However, there were many students who were not able to get a L3 mark due to some gaps in analysis.
- One-sided answer there were some scripts that did not explain limitations of measures at all. These responses were not able to get beyond a low L2 mark.
- Lack of depth of explanation of the workings of the measures:
  - Some students gave very superficial responses when explaining the measures and did not use economics framework in their explanation. They did not explain how the suggested measures work to impact DD/MPB or SS/MPC, and how socially optimal quantity of plastic bags is achieved.
  - Limitations of the measures also tended to be stated rather than explained e.g. education works only in the long run and is thus not sustainable or that the government has imperfect information on the 3<sup>rd</sup> party costs and hence taxes are ineffective to solve market failure. A good answer will explain why 3<sup>rd</sup> party costs are hard to compute who are the 3<sup>rd</sup> parties? Impact on health only occurs in the longer run?, and how the wrong amount of tax can lead to over or under-consumption of plastic bags.
  - When explaining education and campaigns as a possible measure, good responses suggested ways in which the governments can raise awareness and increase saliency of their messages what are the possible platforms, what type of messages should be sent, coming up with interesting slogans such as "Don't be plastic! Say no to plastic!", and reaching out to different target groups. However, these responses were few most students simply said that governments should adopt education/campaigns as a measure and how the change in taste and preferences will reduce the quantity of plastic bags consumed.
- Conceptual errors:
  - There were far too many students who suggested the imposition of a direct tax as a
    possible measure. These students were confused between a direct tax and indirect tax. An
    example of a direct tax is income tax, while tax on a good such as plastic bags is an indirect
    tax. For this question, an indirect tax was more appropriate than a direct (income) tax
    because the plastic bags are a complementary product for groceries and the tax will have
    to be implemented through producers of plastic bags, or the supermarkets
  - Many students misunderstood loss aversion and loosely applied the concept. For a.g. many scripts incorrectly applied loss aversion to a rebate even though a rebate is framed as a "gain" rather than a "loss" and thus would not trigger that cognitive bias.
  - A few students had a wrong concept of government failure. Although they correctly alluded to allocative inefficiency post intervention, they stopped short of comparing the deadweight loss to what it was before intervention.
- Many students did not score good evaluation marks. There tended to be a lack of comparison between government intervention and the measures by individual firms. Many went along with how a combination of measures was best and thus failed to respond to the question on whether the

government intervention is better or efforts by individual firms is better. Some also gave responses regarding what they felt was a best policy. Such conclusions failed to make comparisons regarding the policy being carried out by government versus being carried out by firms, which was the focus of the question.

#### General comments from examiners:

- Poor diagram conventions, e.g. lack of labelling of axes, curves, etc.
- Messy diagrams without ruler usage.
- Diagrams too small and over-crowded with undecipherable lines. The worst is when you squeeze your diagrams along the margins. WHY?
- Diagrams even when well drawn, are rather disconnected from the analysis Students tended not to draw reference to their diagrams in their explanation.
- Illegible handwriting. Examiners are not supposed to guess what the students has written and will just ignore illegible parts.
- No paragraphing. You are supposed to write in proper paragraphs and leave a line after each paragraph.
- Undefined short forms, or excessive use of short forms and arrows and symbols, and coming up with your own acronyms.
- Note that all the above upsets all examiners (locally and in the UK) and will inevitably affect your marks.

#### \*\*\*\*\*\*END\*\*\*\*\*\*

"Success is the sum of small efforts, repeated." ~ R. Collier