Raffles Institution
Nurturing the Thinker, Leader & Pioneer

ECONOMICS

Higher 2

Syllabus 9570

Examiner's Report

Year 5 Promotion Examination 2024

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ECONOMICS

Y5 H2 Promotion Examination 2024

Paper 9570/01
Paper 1

Case Study

(a) With reference to Figure 1, state the month in which tourist arrivals to Japan were the highest. [1]

Suggested Answer:

- February 2024

Mark Scheme:
- *Correct identification of the month – 1m*

Examiners' Comments:
- *Far too many students did not get this question correct. It is important to note the distinction between percentage changes and absolute values in given data and respond to the question accordingly.*

(b) With reference to Extract 1:

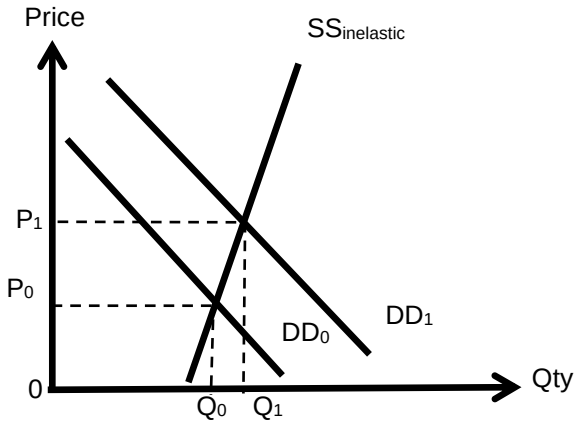
(i) Using a diagram, explain how price elasticity of supply can be used to account for the 'spike in airfares' in the market for US domestic air travel. [3]

Suggested Answer:

- Price elasticity of supply (PES) is a measure of the degree of responsiveness of the quantity supplied of a good to a change in its price, ceteris paribus.
- Clarify PES of US domestic air travel**:**
  - price inelastic since " Ext.1: not enough pilots and flight attendants to run flights, seat capacity still down 6%"
  - suggests low availability of factors of production / lack of spare capacity/factor immobility.

- Explain using a diagram**:**
  - With rise in demand for air travel - "post COVID: travel demand comes roaring back" - due to changes in consumers' tastes and preferences or due to rising income of consumers → shortage at prevailing price level→ upward pressure on price
  - Given PES<1→ the increase in demand will lead to a 'spike' in price as it is relatively more difficult to increase quantity supplied of air travel → **it requires a significant increase in price to clear the shortage**.
  - As shown in diagram below, when the demand curve shifts from D_0 to D_1, due to the price-inelastic supply, a significant increase in price is required to clear the shortage, OR the airfare will rise more than proportionate from P0 to *P1* **compared to** the rise in equilibrium quantity from Q0 to Q1.

- Using a diagram: **[1m]**



Mark Scheme:

- *State PES value – price-elastic or price-inelastic*
- *Rise in DD, and explanation on significant increase in price – 1m*
- *Accurate diagram - 1m*

Examiners' Comments:

- *Most students could earn the full range of the marks for this question - using a well-drawn diagram to explain how the price-inelastic supply led to a greater extent of rise in price compared to the rise in equilibrium quantity. Such answers also demonstrated good use of case evidence and were able to point to the 'lack of pilots and flight attendants' as the reason for the low PES value.*
- *However, there were numerous scripts that had gaps in analysis, including:*
    - *using own knowledge for PES such as time needed to build aircrafts instead of appropriate use of case evidence*
    - *inappropriate use of case evidence for PES such as a rise in jet fuel cost. This should be linked to a fall in supply, thereby causing a leftward shift in the supply curve, instead of a reason for the PES - which is the gradient of the supply curve.*
    - *not comparing the extent of change in price to the extent of change in equilibrium quantity or not stating that 'a huge rise in price is necessary to clear the shortage'.*
    - *not knowing that PES should be applied to a change in demand i.e. a shift of the demand curve. These weaker scripts erroneously linked PES to a shift in the supply curve.*
    - *Poorly illustrated diagrams – missing labels, or SS is not price-inelastic, or the significant change in P is not made obvious.*

(ii) Explain one possible reason for the entry of low-cost carriers despite consolidation of market share by the five largest airlines. [3]

Suggested Answer:

- Explain what is meant by consolidation of market share
    - increase in market concentration ratio of top 5 firms in the market implies increased market power of these dominant firms. This increases their ability tap on their substantial internal economies of scale and use limit pricing or other non-price strategies to block entry of low-cost carrier.

- Explain how low-cost carriers can enter
    - low-cost carriers operate on a different cost structure – despite lower scale of production and less iEOS → enjoys lower costs as compared to large airlines.
        - lowers AC and MC due to 'no frills travel'
        - Extract 1: 'no internet nor seatback entertainment'; 'limit amenities to bare minimum'
    - the lowered average costs allow these firms to make at least normal profits and survive the competition
    - moreover, if variable costs are lowered, the lower MC allows them to charge lower air fares. This is likely to increase their revenue if the demand by budget-conscious travellers is price-elastic (larger proportion of income)
    - In addition, charging for add-ons such as seat selection, food and luggage allows the firms to both increase revenue and cut cost as wastage is reduced, thereby increasing profits

Mark Scheme:

- *Explain consolidation to increased market power / increased BTE – 1m*
- *Reason linked to case evidence: Explanation linked to lower cost eg. No frills and thus higher profits and survival OR lower prices given lower cost to better able to compete with incumbents – 2m*

Examiners' Comments:

- *Students who used case evidence to link to lower cost either resulting in higher profits or lower prices tended to be score better than answers that were purely descriptive without any attempt to link to outcomes for the low-cost carriers such as profits or lower price to allow them to compete.*
- *Some answers did not score well as case evidence was not used. Such answers used their own reasons such as low-cost carriers' ability to tap into markets by offering a lower fare for budget travel where consumers' demand is price-elastic as a justification for entry into the market. Such responses did not link to why the airlines are able to charge lower airfare.*
- *Flawed responses linked the entry of low-cost carriers to low entry barriers. Such an argument is not valid as there are definitely substantial entry barriers in the airlines industry. Some examples of such barriers include the cost of aircraft and the brand loyalty created through advertising and promotion as well as goodwill earned by these incumbent airlines. Moreover, the question also suggested that market consolidation is likely to further raise the entry barriers. The same flaw arose in answers that suggested a saucer-shaped LRAC curve to account for the co-existence of smaller low-cost carriers and large airlines. Such a response again ignores the huge economies of scale that exist in the airlines industry.*
- *Most answers failed to respond to the second half of the question i.e. 'consolidation of market share by the five largest airlines'. Good responses are expected to make a brief link/statement of how consolidation increases entry barriers for new firms.*

(c) Explain how the value of price elasticity of demand for Allegiant Air's flight service may change when it taps on cognitive bias in its strategy. [3]

Suggested Answer:

- State change in PED value: value may fall and demand becomes more price inelastic
- Explain strategy supported by case evidence:
    - Extract 2: loyalty programme for holders of Allways Visa Card - instant benefits such as early check in, boarding and free drink
    - this induces customer loyalty as the differentiated services tap on consumers' loss aversion - where consumers tend to avoid loss than wants of equivalent gains
    - As a result, perceived cost of switching to another airlines may be greater → e.g. enjoy slightly lower prices when they switch.

- This incentivises/compels consumers to continue to fly with Allegiant, given the risk of members losing these instant benefits;
- This reduces substitutability of Allegiant's flight services and demand for Allegiant's services become **more price-inelastic** or **less price-elastic**.

- Alternatively, response could also discuss 'sunk cost fallacy'
  - consumers have already invested in the Allegiant loyalty programme - and will continue to use the airline services to accumulate loyalty points
  - they do not want to risk losing time and money invested in accumulating the points.
  - this reduces substitutability and are less likely to switch airlines
  - as a result, demand for Allegiant airline services becomes **more price inelastic**.

Mark Scheme:

- *stating direction of change in PED value – 1m*
- *reason inked to cognitive bias (strategy of loss aversion/ sunkcost fallacy + case evidence + reduced substitutability – 2m*
- *cap at 2 m if not linked to 'reduced substitutability' or 'no use of case evidence'*

Examiners' Comments:

- *This question was rather well-attempted with good justification for the change in PED value – and good understanding of at least one type of cognitive bias based on the loyalty programme or instant benefits offered by Allegiant Air's VISA card. In fact, good answers were able to skillfully apply both loss aversion and sunk cost fallacy in the responses.*
- *Weaker scripts tended to*
  - *state the type of cognitive basis without any elaboration of how it is tapped on to retain customers*
  - *surface case evidence without any attempt to link to a particular form of cognitive bias*
  - *link to salience bias without linking this to marketing efforts by Allegiant Air*

(d) (i) With reference to Figure 2, identify the market structure in which the US domestic airlines operate. Justify your answer. [2]

Suggested Answer:

- State: oligopoly
- Justify:
  - **4-firm market concentration ratio of 73-75%** OR
  - 3-firm market concentration ratio of 57-58%
  - *Note that the data is on number of seats, so the combined share of the 3 or 4 largest firms needs to be divided by the total of 99 million seats*

- Conclude that the market for US domestic airlines **dominated by few large firms**.

Mark Scheme:

- *State market structure – 1m*
- *Calculate **market concentration ratio** + link to characteristics – 1m*

Examiners' Comments:

- *Most answers correctly identified oligopoly as the relevant market structure and made an attempt to calculate the 3 or 4-firm market concentration ratio.*
- *However, many answers were imprecise in calculation and gave vague or inaccurate combined % share of these dominant firms. Students also need to pay heed to the fact that the data in the case was not presented in percentages, but in in terms of the total number of seats.*
- *There were many candidates that failed to understand that this is a 2-mark question that warrants a concise and precise response – using only information from Figure 2. Such answers went into a*

long dissertation of the four characteristics of an oligopoly. That valuable time wasted should instead be saved for the higher mark questions. There is always an opportunity cost for unnecessary efforts expended.

- *In addition, there were many answers that did not make an explicit conclusive statement that the market is thus dominated by a few large firms - that being the hallmark of an oligopoly.*

(ii) Discuss whether you agree with the writer's opinion on the US Justice Department's decision to block the merger between JetBlue and Spirit Airlines. [8]

Suggested Answer:

Introduction

- define merger
- clarify aim of government (Justice department) → maximise society's welfare and achieve goal of allocative efficiency and equity
- clarify 'writer's opinion'→ supports merger of Jetblue and Sprit Airlines
- clarify that whether view is supported depends on the impact on society
  - yardsticks of allocative efficiency, dynamic, productive efficiency and equity
  - on consumers via yardsticks of price, output, choice and quality

Body

Thesis: Agree with author's view → support merger

1. Dynamic efficiency - increases consumer welfare through better quality airline services.

- merger leads to an increase in market share and a larger scale of operation → allows the firm to increase profits with the possible rise in AR and fall in LRAC due to greater internal economies of scale
- increased profits allow the firm to better compete against the largest US airlines (as inferred from Ext 3) in terms on non- price competition
- increase firm's ability to be more dynamic efficient and conduct R&D to product innovate such as "seat back innovation" or "flat beds on transcontinental routes" introduced by Jet blue (ext 1: bring new product innovation to market)
- improve quality of airline services to consumers→ increase consumer welfare

Diagrammatic Analysis:

- From Figure 2, the demand for the merged firm (Jet Blue and Spirit) increases from AR0 to AR1 and become less price elastic as there are fewer airlinse firms in the US domestic carriers industry with the merger. Similarly, the corresponding MR will increase from MR0 to MR1. Hence, the profit maximising output and price increases to Q1 and P1 respectively. It will have a greater price setting ability and profits increases to (P1-AC1) *Q1.

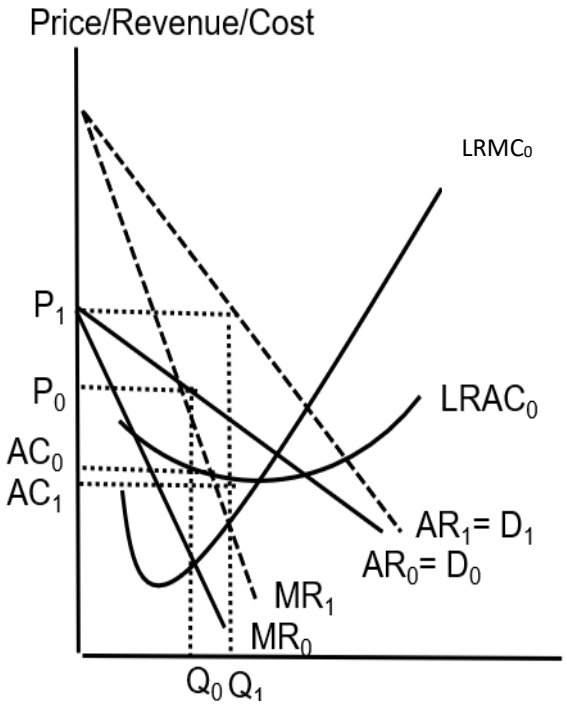


Figure 2

2. Cost savings for the merged firm - lower airfares for consumers

- merger allows for greater internal economies of scale to be reaped (Extract 3: benefit from scale economies in technology and analytics)
  - for example, technical economies due to the greater use of IT and analytics in larger datasets where use of such large software can be more efficiently utilised, given a larger consumer base and thus lower firm's unit production cost
  - fall in LRAC (as depicted by a downward movement along LRAC curve) as firm produces closer to MES and moving towards productive efficiency from society's perspective.
  - Such cost savings by the firm can be passed to consumers as lower prices. From Figure 3, the lowering of SRMC due to internal economies of scale leads to a higher profit maximising output of Q2 and a lower price of P2, which benefits consumers especially those who are budget-conscious and where airfare takes a larger proportion of their income.
  - This is in sync with Extract 3 which mentions that prior to the merger, the two airlines have a history of bringing lower airfares to the market. As competition intensifies with the merger, they are also more likely to do so.

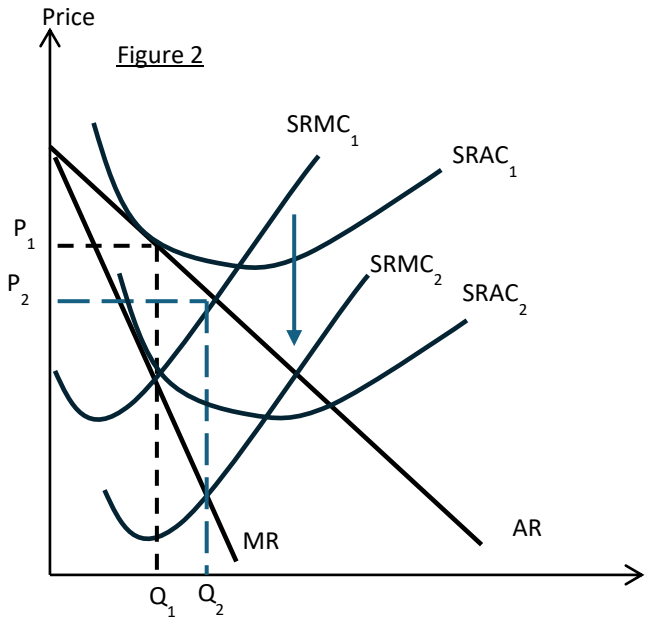


Figure 2

Figure 3

Anti-thesis: Disagree with author's view→ don't support merger of the airlines

1. Society's welfare worsened due to increased allocative inefficiency/ fall in consumer welfare due to higher prices

- merger increases extent of allocative inefficiency and increases consumer exploitation in terms of higher prices. From Figure 4, the profit-maximising firm will raise price above MC of production by a greater extent, hence allocative inefficiency increases. This implies that the benefit forgone from the under-consumption of the good would be greater compared to the opportunity cost incurred in production of the goods.
- at the new profit maximising output Q2, equilibrium price and output have increased to P2 and Q2 respectively. The extent or P>MC (P_2-C_2 > P_1-C_1) increases since the demand for the merged airline service is now relatively more price inelastic and the amount of the welfare loss to society arising from the under-production of the good increases.
- society's welfare is reduced because the merger would have given the merged entity substantial market power ['Extract 3: lessen competition and harm consumers'], which raises demand and makes the demand more price inelastic with less available substitutes.
- consumer welfare is worsened because consumers have to pay higher prices leading to a fall in consumer welfare due to reduced affordability. There is also greater inequity since there is a transfer of consumer surplus to the firm in the form of higher profits.

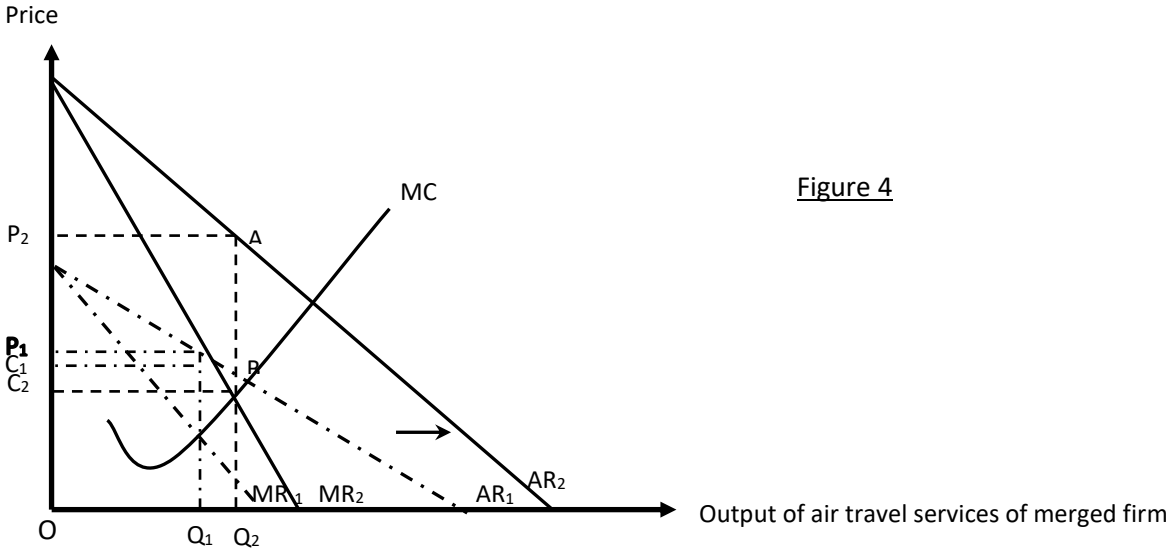


Figure 4

- reduces choice in terms of number of airline firms since fewer competitors also mean fewer choices for consumers, lowering their consumer welfare.

2. Can also link to less willingness to be dynamic efficient

Conclusion/ Evaluation

- Given the lower combined market share of Jet blue and Spirit which is still less than 10% as seen in Figure 2 from the case, the merger will not significantly increase its market dominance or extent of allocative inefficiency. The merger can instead allow the firm to better compete with the existing larger airlines in terms of price and quality of services. In other words, competition may intensify with the associated benefits arising from competition.
- Moreover, given mutual dependence in an oligopoly, lower fares offered by the merged firm is likely to be matched by rivals. That also extends to the willingness to innovate as competition intensifies. The result is more affordable air fares and better quality of onboard airline products and service offered to consumers.
- Thus, while choice in terms of the number of firms is reduced, the potential improvement in quality of air travel services and increased affordability due to lower prices in the long may favour the author's view towards supporting the merger.

Mark Scheme:

	Knowledge, Application, Understanding and Analysis	
L1	▪ *no theoretical framework/descriptive and journalistic writing* ▪ *meaning of question not properly grasped* ▪ *did not use correct theoretical framework i.e. MR-MC analysis* ▪ *major conceptual errors* ▪ *answer mostly irrelevant or inaccurate.*	*1-3*
L2	• *MR-MC framework used appropriately* • *balanced response with both T and AT* • *at least 1 T and 1 AT* • *different perspectives taken (with links to society and consumers' welfare)* • *applied case evidence.*	*4-6*

E1	▪ *not well reasoned or irrelevant to question or lacking an overall judgement.* - *eg. unsubstantiated judgment on whether the merger is a concern based on case evidence.*	*1*
E2	▪ *well-reasoned evaluation based on main arguments leading to a judgement.* - *eg. well-reasoned judgment on whether the merger is a concern with good reference to case evidence*	*2*

Examiners' Comments:

- *Most students have good textbook knowledge of the benefits and costs of a merger, and this was put to good use for this question. It was also heartening to see that students could draw diagrams showing effects of rise in DD on price and profits and effects of economies of scale on price adequately and under timed conditions.*
- *However, there remains the issue of inappropriate response to the question. The response was supposed to be on whether one agrees with the writer's opinion and the writer was in fact in support of the merger. This ran contrary to the US Justice Department's decision to block the merger.*
- *Weaker scripts misunderstood the article and began with the premise that the writer was against the merger. Moreover, there were answers that did not pay heed to the writer's opinion at all and went into a whole answer about whether the US Justice Department should block the merger or not. Although the ideas were well-explained, such answers did not earn the full range of the marks for both level analysis and evaluation. In short, there needs to be a clear and direct response to the question per se.*
- *There were numerous scripts that went into a whole theoretical discussion of the benefits and costs of a merger without any reference to the case evidence on issues linked to innovation, lower fares and fear of market dominance.*

- ***Other Areas for Improvement:***
  - *A handful of answers attempted a rather indirect analysis. Instead of examining the effects the merged entity will have on society and consumers, such answers took the indirect approach of examining how the effects on the other firms will impact on society and consumers. As a case in point, a direct approach will be to examine how the merged entity will have more market power and be more allocatively inefficient, as well as how more profits can lead to innovation. Indirect analysis chose instead to examine how a fall in demand for the other firms will lead to lower prices, and thus couch this as a benefit to society and consumers.*
  - *In some answers, the scope of analysis was restricted as the focus was totally on the effects on firms and other firms. This is indeed a narrow approach as a government's concern is often about consumer exploitation and associated consumer welfare. And the effects on allocative efficiency and dynamic efficiency always have to be analysed in questions linked to government intervention for firms' competition and market power.*
  - *Some students devoted most of their discussion to all possible types of internal economies of scale without finally linking these to the effects on efficiency and consumers. There were also scripts that gave a purely textbook explanation of the various types of economies of scale without applying case evidence of technical economies.*
  - *Some answers did not apply economic analysis to what was in the case on allocative efficiency and dynamic efficiency, but chose to focus on ideas such as diseconomies of scale and X-inefficiency. Though these ideas were valid, such answers suffered from weak use of case evidence. And in essence, allocative efficiency and dynamic efficiency are pertinent issues that ought to be discussed in any such question pertaining to a merger.*
  - *The discussion of dynamic efficiency was not well developed and was mainly descriptive. Good analysis will require answers to link to the ability to do so as the profits of the merged firm rises – with good reference to the diagram showing how rise in DD/AR leads to an increase in profits. Or link to how Figure 2 in the Case shows an increase in market share and a possible intensification of competition.*

(e) Discuss whether there is a case for government intervention to solve the problem of over-tourism in Japan. [10]

Suggested Answer:

Introduction

- Government intervention is required when the market fails to achieve allocative efficiency and max. society's welfare. Market failure is defined as the failure of the free market to achieve an efficient allocation of resources that maximises the society's welfare.

Body

Thesis: Case for Government Intervention to solve problem of over-tourism

- market failure in **market for tourist services** in Japan - negative externality in consumption due to over-tourism

- explain the negative externality: tourists in Japan can result in overuse and overcrowding of resources (Extract 4: 'strain on transport infrastructure; jostling with passengers on buses), creating pollution through traffic emissions, litter and noise and privacy concerns which are detrimental to the welfare of the residents. These are the third parties who are not directly involved in the tourism market and are not compensated for the inconvenience caused. As a result, they suffer from increased stress and a lower quality of life.
- existence of MEC (or -MEB) causes a divergence between MPB (utility derived from tourists visiting Japan and places of interest) and MSB.
- From Figure 5, in the market for tourism services, self-interested tourists who aim to maximise their utility will consume Qe units of tourist services at free market equilibrium where MPB=MPC. However, the allocatively efficient output of tourist services is at Qs where MSB=MSC.
- Since Qe>Qs, this results in an over-consumption of tourism services (too many tourists in Japan), resulting in deadweight welfare loss of ABC.
  - sum of opportunity costs incurred by society for resources used to produce Q_sQ_e units of tourist goods and services (area BAQeQs) is higher than the total societal benefits gained from consuming these units (area ACQeQs). There is an over-allocation of resources and society's welfare is not maximised.

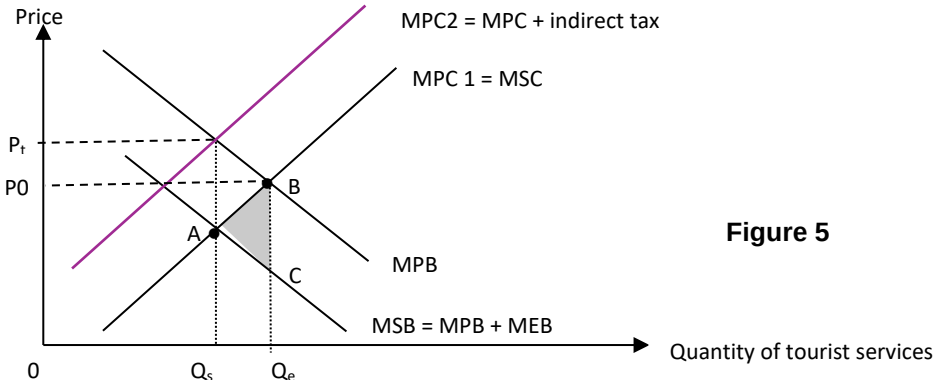


Figure 5

- **A brief link to intervention eg. tax on tourism**
  - imposing a tourist tax ('Extract 4: visitors charged 100 yen fee to visit shrines) is akin to an indirect tax to eliminate or make tourists internalise the effects of negative externalities)
    - Hence, the government can implement a specific tax per unit equal to MEC at OQs as seen in Figure 5.

- **<u>As an indirect tax falls on firms</u>**, this will force companies that provide tourist services to internalise the negative externalities, causing the MPC curve to shift to MPC2=MPC + tax.
- As the price of tourist services in Japan increases, tourists will then reduce their quantity demanded to the allocatively efficient level of OQs by equating their MPB=MPC 2 (MPC+tax).
- overconsumption and deadweight loss of area ABC will be eliminated, thereby achieving allocative efficiency

Or government can also work on improving transport infrastructure eg. expanding bus and taxi fleets / establish direct bus routes → reduce MEC and move Qs closer to Qe.

Anti-thesis: Case against Government Intervention

1. Ineffectiveness of government policies or in a worse-case scenario – government failure

- due to imperfect info, it is difficult for the government to correctly determine the amount of MEC arising from tourism-related activities and thus difficult to estimate the correct amount of tax to impose.
- Hence, the government may under-tax (such as 100 yen per visitor which could be a token amount), causing the overconsumption of tourism related goods and services to persist. In this case, deadweight loss will not be totally eliminated.
- Theoretically, there can also be a case of over-tax which causes a greater deadweight welfare loss. In this regard, there is government failure that worsens welfare for society.
- Building transport infrastructure takes time and is not an immediate solution; and it also depends on ability to finance

2. Conflict with other (macro-economic) objectives

- Tourism tax may not be the best way especially for economies which are heavily dependent on the tourism sector for economic growth. With a fall in output of tourism services from Qe to Qs (due to the indirect tax), there will be a fall in tourism revenue. This can result in negative economic growth, resulting in a fall in citizens' standard of living. The impact is also felt through a loss of jobs since a fall in output will lead to a fall in demand for labour – which is a derived demand since labour is a factor of production.
- From Extract 4, 'Kyoto drew some 32 million visitors overnight in 2023 and economic impact reaches 1.1 trillion yen'. This suggests the significance of tourism to the Japanese economy.
- In this regard, there is a conflict between achieving efficiency in resource allocation and achieving macroeconomic objectives of economic growth and full employment.

Conclusion and Evaluation

- The case for government intervention depends on:
  i. extent of the negative externalities which might be immensely huge – given 32 million tourists 'descending' on a destination with 2.5 million residents. One can imagine the inconvenience faced by the residents especially tourists with 'bad behaviour'.
  ii. extent of repercussions effected on the economy. This in turn depends on tourism revenue as % of GDP. i.e. whether Japan is highly dependent on tourism for employment and economic growth.
    - Japan may need the tourism revenue as it has barely recovered from the aftermath of Covid-19 lockdowns and its huge spending on the Olympics 2020. Moreover, it has a greying population which makes reliance on domestic spending difficult. In that case, Japan may really be dependent on tourism revenue and this may explain why the tax implemented is a nominal sum.
    - The government needs to weigh which **are pressing concerns - efficiency in resource allocation vs or greater employment and economic growth**. Interestingly, both affect quality of life. This leads us to ponder if the Japanese society values private space over material gains?

iii. the choice of policy measure
- As a case in point, the use of tourism taxes may have adverse effects on economic growth and employment. Conversely, measures to improve transport infrastructure may yield long-term benefits as it can accommodate more tourists and help stimulate the economy. At the same time, residents can also benefit from the convenience brought about by improved transport.

Mark Scheme:

	Knowledge, Application, Understanding and Analysis	
L1	▪ *descriptive and journalistic writing* ▪ *no theoretical framework / inappropriate theoretical framework i.e. did not use market failure framework* ▪ *answer mostly irrelevant or inaccurate/ smattering of points* ▪ *only AT i.e. no case for intervention*	*1-3*
L2	▪ *relevant market failure framework* ▪ *balanced response i.e. with T and AT [**1 T and 1 AT suffices**]* ▪ *T linked to a detailed explanation of market failure due to negative externalities* ▪ *AT linked to a well-developed argument in terms of either ineffectiveness of government intervention or conflict with other objectives* ▪ *need depth of analysis to get full credit: example of negative externality should be explained (i.e third party cost elaborated)* ▪ *applied case evidence.*	*4-7*
E1	▪ *Evaluation not well reasoned or irrelevant to the question or lacking an overall judgement.* ▪ *Vague/ unsubstantiated judgement*	*1*
E2	▪ *Well-reasoned evaluation based on main arguments leading to a judgement.* ▪ *Judgement well-substantiated with reference to case evidence*	*2-3*

Examiners' Comments:

- *The question required students to argue the case for government intervention which is clearly about the problem of market failure brought about by negative externalities in consumption. A good counter-argument will be to consider the effects on other government objectives as mentioned in the case. Another possibility is to link to government failure when a government intervenes. In this regard, some awareness of interventionist measures is essential but the FOCUS of the question is **not** about a discussion of measures and their limitations. Students who took the latter approach had misinterpreted the question and therefore could not score well for this question. Such answers usually went into a lengthy discussion of all the measures in the case such as tourist taxes and improvement of transport infrastructure.*
- *There were also weaker scripts that used a simple demand-supply framework without any awareness that they were expected to showcase their knowledge of market failure that links to MPC/MPB vs MSB/MSC>*

Some Areas for Improvement:

- *Poor or no explanation of the MEC on the residents who are the third parties. Case evidence was merely lifted without a clear explanation of how these residents' quality of life might have been affected.*
- *A good example of a market in this context will be the market for tourism services. Unfortunately, this was not indicated in most answers.*
- *In some instances, the market failure problem was not rigorously explained. There was lack of a*

clear explanation of the divergence between free market equilibrium and social optimal equilibrium. And the deadweight welfare loss was not correctly shaded. And the implication that an allocatively inefficient outcome meant that MSC > MSB was missing in most answers.

- *Students were able to sieve from the case evidence that an argument against intervention was about the adverse impact on economic growth. But they often lifted these evidence without any accompanying economic analysis. To lend greater credibility to their analysis, candidates could have linked the fall in output due to indirect tax (from the market failure diagram) to a fall in tourism revenue. This could then be linked to examples of sectors that depend on tourist revenue such as hotels, restaurants and tourist attractions. The analysis can then be extended to the effect on jobs as to the production of tourism services. This will rather elegantly justify the case against intervention for reasons which are shown in the Evaluation segment of this suggested answer.*
- *Some conceptual errors. A tourist tax is a tax on goods and services and is therefore an indirect tax that falls on firms first. So a correct illustration will be to shift the supply curve (MPC curve) instead of the demand curve (MPB curve).*
- *Evaluation points were not well developed due either to lack of time or the aforementioned misinterpretation of the question. A judgement should have been made on what are pressing concerns for Japan – whether it needs the tourism revenue or needs to correct failure, which both do affect the quality of life of the Japanese citizen.*

Paper 9570/02
Paper 2

1 Electricity prices in Singapore have increased in 2024 due to higher carbon tax, an increase in price of natural gas and continued income growth. Singapore relies heavily on imported natural gas for its electricity generation. The government has distributed climate vouchers to households in Singapore to encourage the switch to energy-efficient electrical appliances.

Source: The Straits Times, 2023

(a) Explain why rising cost and continued income growth have led to a large increase in price of electricity. [10]

(b) Discuss whether the removal of the carbon tax is better than climate vouchers to manage the rise in price of electricity. [15]

Part (a)

Introduction

- Clarify key terms:
  - Price of electricity is determined by the demand and supply of electricity in the market.
  - Rising cost→ rising cost of production of electricity can be due to an "increase in carbon tax" and "increase in price of natural gas" → fall in supply
  - Continued income growth → increase in income levels of households → rise in demand

- Interpret the requirements of the question
  - "large increase in price of electricity" is due to rise in demand and fall in supply, coupled with the price-inelastic demand and supply.

Body

R1: Explain how the rising cost affects supply + PED<1 → large increase in price of electricity

- Higher carbon tax
  - Carbon taxes are indirect taxes imposed on producers of carbon emissions
  - Generation of electricity produces carbon emissions → producers will have to pay carbon taxes
  - Rise in carbon tax will act like an increase in cost of production → decrease willingness and ability to produce electricity at each price
  - Fall in supply of electricity

- Increase in price of natural gas
  - Natural gas is a factor input used to generate electricity.
  - With an increase in price of natural gas, there will be an increase in cost of production
  - Profitability at each price level falls → fall in willingness and ability to produce
  - Fall in supply of electricity
  - Given that the natural gas is an important FOP in the generation of electricity → there could be a significant fall in supply

- **Analysis (Price Adjustment Process)**
  - The fall in supply is reflected by the leftward shift of the supply curve from SS0 to SS1.
  - At the original price P0, there is a shortage of Q0Qs as quantity demanded (Q1) exceeds the new quantity supply (Qs).
  - This will cause an upward pressure on price as the consumers bid for the limited electricity

- As price increase, quantity demanded will fall due to the income (where real income and thus purchasing power falls) and substitution effect (switch to alternatives – unlikely in this case), while quantity supplied will start to increase as profitability rises.
- This adjustment process of price increase, fall in Qd and rise in Qs will continue until the shortage is cleared at the new equilibrium price, P1, and equilibrium quantity, Q1.

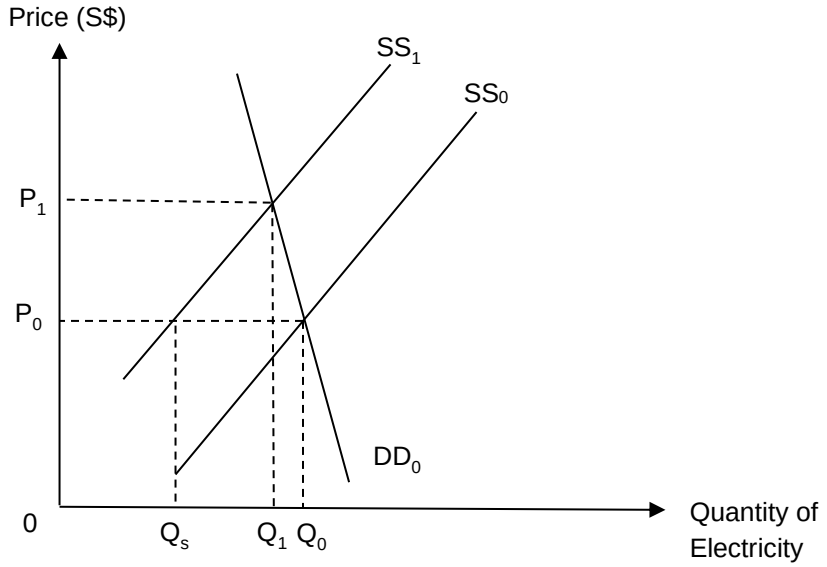


Figure 1: Market for Electricity

- **Explain: "large rise in price"**
  - Given that the **demand for electricity is price inelastic (PED < 1)** as there are no close substitutes to electricity in Singapore, and electricity is habitually used in daily lives to power electrical appliances such as lighting, air conditioning and electronic devices.
    - PED < 1: The rise in price leads to a less than proportionate fall in Qd, cet par.
    - **As consumers are less responsive to price changes, a significant increase in price from P0 to P1 is required to clear the shortage of Q0Qs at Q1 → "large rise in price"**
    - *Alternatively, students may illustrate DDinelastic vs DDelastic to compare the extent of the price change.*

R2: Explain how continued income growth affects demand + PES<1/combined shift to explain large increase in price

- Rising income level
  - As households/individuals enjoy rising income levels → greater purchasing power
  - This will lead to an increase in demand for electricity as consumers are more willing and able to purchase electricity as electricity is a complement in the consumption of electronic appliances and devices e.g. leave lights, TVs, air-conditioning on for longer time periods, and greater use of electronic devices → YED > 0
  - Also, as income levels in a country rises, there is greater demand for goods and services (normal goods) → businesses will require more electricity to produce these goods and services as electricity is a derived demand.

- **Analysis:**
  - The increase in demand for electricity is reflected by a rightward shift of the demand curve from DD0 to DD1 as shown in Figure 2.

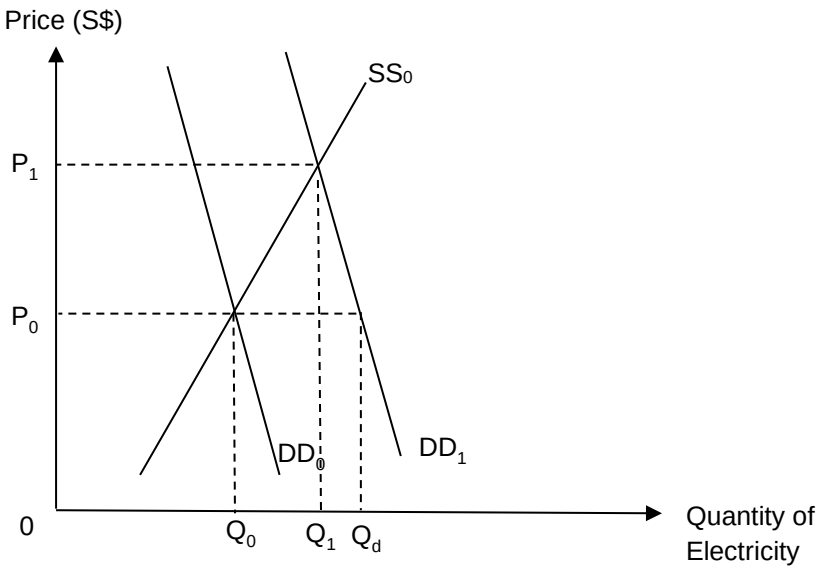


Figure 2: Market for Electricity

- At the original price P0, there is a shortage where the new quantity demanded (Qd) exceeds the quantity supplied at Q0. As explained earlier, the shortage will lead to a rise in equilibrium price from P0 to P1 and rise in equilibrium quantity from Q0 to Q1.

- **Explain: "large rise in price"**
  - Given that the **supply of electricity is *likely* to be price inelastic (PES < 1)** as there is a lack of spare capacity in terms of limited power plants in Singapore to generate electricity and time is required for more powerplants to be built to increase capacity. OR immobility of FOP – requires import of natural gas from Indonesia.
    - PES < 1: The rise in price leads to a less than proportionate rise in Qs, cet par.
    - **As producers are less responsive to price changes, a significant increase in price from P0 to P1 is required to clear the shortage of QdQ0 at Q1 → "large rise in price"**
    - *Alternatively, students may illustrate SSinelastic vs SSelastic to compare the extent of the price change.*

- **Alternatively,** instead of using the concept of PES to explain large rise in price, students may look at the combined effects of fall in SS and rise in DD.
  - From Figure 3: At original price P0 → shortage of QdQs → upward pressure on price → prices adjust until new equilibrium price P1 and equilibrium quantity Q1 where the shortage is cleared.

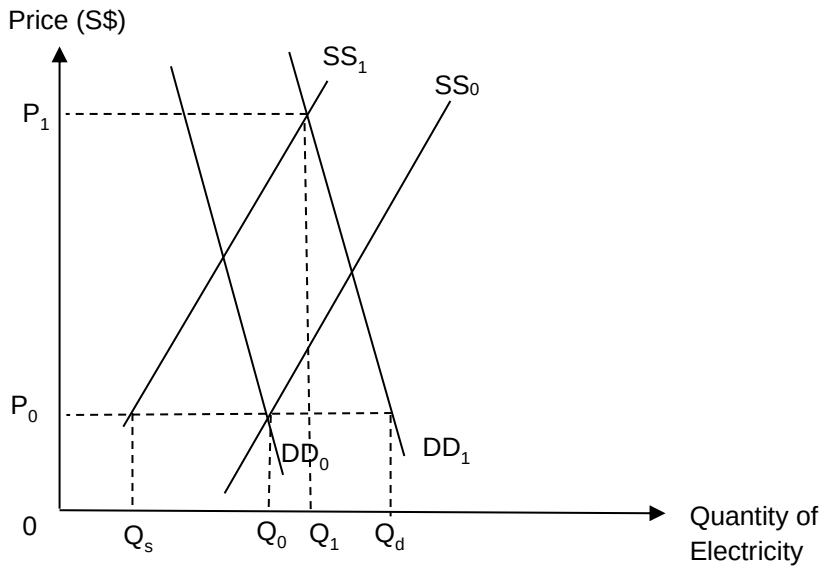


Figure 3: Market for Electricity

Conclusion:

- The combined effect of rising costs and increasing income levels leads to a large increase in price of electricity.

Mark Scheme:

Knowledge, Application, Understanding, Analysis		
L1	- *Answer is irrelevant in analysis or contains little economic analysis or contain a few relevant statements that are stated briefly/ superficially* - *Contains fundamental conceptual errors in analysis* - *Poor understanding of concepts of demand and supply and unclear link to determinants*	***1 – 4***
L2	- *Generally sound analysis with some gaps* - *Lack of scope of explanation: only R1 or R2 explained, or/and did not address the "large increase in price"* - *Insufficient depth of elaboration e.g. price-mechanism not elaborated, factors affecting demand and supply not explained*	***5 - 7***
L3	- *Good scope and depth of analysis with good application to the context of electricity.* - *Both DD-SS factors well analysed:* *-R1: SS + PED <1 (to justify large extent of increase in price)* *-R2: DD must be explained using YED concept to explain increase in income leads to increase in demand + PES<1 (to justify large extent of increase in price) OR justify sharp increase in price using combined shift* - *Well-illustrated analysis /diagrams* *Adjustment process well explained*	***8 - 10***

Examiners' Comments:

- *This question was a popular question and generally well attempted as students recognized the 2 requirements and the need to use elasticity concepts to explain the sharp increase in price of electricity. There were also a large number of students explained the price adjustment process very well, with detailed elaboration of how consumers and producers react in response to the shortage created. Well done!*
- *Lack of depth of analysis:*
    - *While most students identified the 2 requirements of rising cost leading to a fall in supply and income growth leading to an increase in demand, some students did not explain why cost rises at all, and/or did not explain why increase in income will lead to increase in DD for electricity.*
    - *There should be some recognition that natural gas is a key factor input used to produce electricity and students are to note that there is a need to apply YED to explain why income leads to an increase in demand for a good, according to their YED value.*
- *A handful of the students used inconsistent economic framework in analysis – these scripts used firm-level analysis to explain how rising costs lead to rising MC and AC and hence price for a firm producing electricity, and used a DD/SS framework to explain how continued increase growth leads to a rise in demand and hence price of electricity. Students are expected to use a DD/SS framework to analyse the changes in both supply and demand and hence impact on price for this question requirement. Or they are expected to at least use the same framework to explain the 2 factors.*
- *A significant number of students show weak application of elasticity concepts to justify a sharp increase in price.*
    - *Quite a fair number of students did not explain PED/PES determinants very well. Students are to note that necessity is generally used to justify YED value rather than PED value. PED of electricity should be linked to lack of close substitutes. There was also weak explanation on why SS is likely to be price-inelastic with insufficient links to the determinants of PES.*
    - *The rule of thumb to follow is to apply PED with SS changes and PES with DD changes.*
    - *The "large increase in price" was stated rather than explained – students need to link how responsiveness of consumers and producers will impact the extent to which prices will need to adjust for the shortage to be cleared.*

Part (b)

Introduction:

- The removal of the carbon tax increases supply while the climate vouchers encourages the switch to energy-efficient appliances thereby reducing the demand for electricity. Both an increase in supply and a decrease in demand for electricity can lead to a fall in price of electricity.
- "better" policy can be measured in terms of effectiveness, desirability and feasibility.
    - Effectiveness: how well it works to reduce the price of electricity
    - Desirability: welfare effects, unintended consequences
    - Feasibility: budget constraints, sustainability of the policy

R1: Discuss how removal of carbon tax → reduce the price of electricity

<u>Thesis: Carbon tax → reduce the price of electricity</u>

- As established in part (a), carbon taxes are imposed on producers of electricity as generation of electricity results in carbon emissions which causes pollution.
- With the removal of carbon tax, producers no longer have to pay this tax to he government → this acts like a fall in the cost of production → this increases profitability at each price level → incentivizes producers to increase production of electricity where supply increases from SS1 to SS2.
- At P1, there is a shortage of QdQs leading to a surplus and a downwards pressure on price from P_1 to P_2, decreasing the price of electricity.

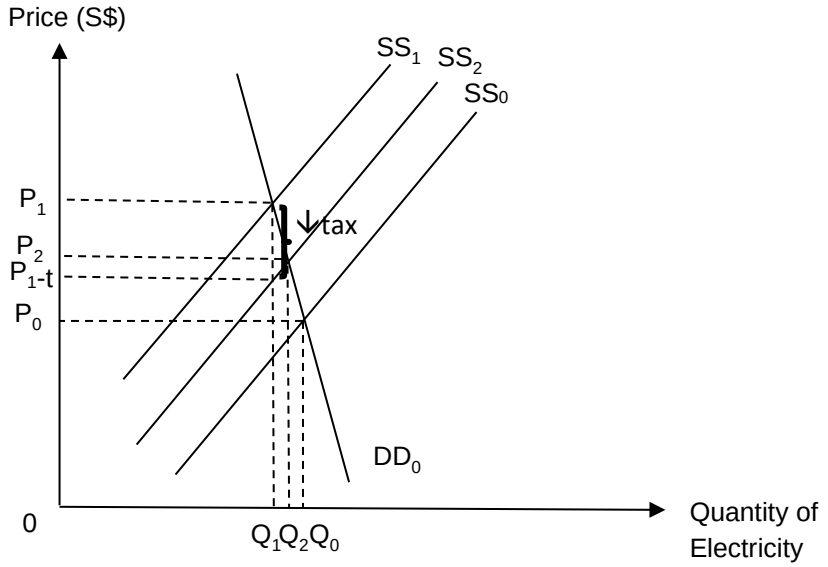


Figure 4: Market for Electricity

- Given that the demand for electricity is price-inelastic as explained in part (a), the increase in supply would lead to a significant decrease in price of electricity to clear the surplus since consumers are less responsive to changes in price, making the policy highly effective.

Anti-thesis: Limitations of removing carbon taxes

Students are expected to look at 2 areas:

- Effectiveness:
  - In 2024, carbon tax is set at S$25/t$CO_2$e (low compared to other European countries).
  - Carbon tax may not be a significant cost to the producers as compared to cost of other factor inputs such as natural gas → hence the increase in supply may not be significant to decrease the price significantly.
  - Singapore relies heavily on imported natural gas to generate electricity. The price of natural gas is a key factor input in producing electricity, and since there is an increase in price of natural gas, the removal of carbon tax is unlikely to cause an overall fall in price of electricity but will dampen the increase in price from P0 to P2 instead of P0 to P1.

- Desirability:
  - The removal of carbon tax might lead to unintended consequences → in the first place, the carbon tax is implemented to force producers of electricity to internalize the negative externality and reduce over-production of electricity. The removal of tax will lead to the rise in quantity of electricity produced and disincentivizes firms switch to cleaner ways to producing electricity → worsen air pollution due to carbon emissions emitted in the process of generating electricity. This could lead to air pollution and climate change/global warming → welfare loss.
  - The government also collects lesser tax revenue (t*Q_2) and has less funds to allocate to improve public infrastructures, and healthcare services which is essential in view of Singapore's ageing population, or less funds to spend on developing green technology to reduce carbon emissions produced in the country.

- Feasibility:
  - Singapore set out Green Plan 2030 → net zero emissions by 2050 → to meet this objective, not feasibility to cut carbon tax.

R2: Discuss how climate vouchers → reduce the price of electricity

Thesis: Climate vouchers → reduce the price of electricity

- The government has distributed climate vouchers ($300) to household in Singapore to encourage the switch to energy-efficient electrical appliances. These vouchers are applicable to appliances with certain energy efficient ratings e.g. air-conditioners (✓✓✓✓✓), washing machines (✓✓✓✓), refrigerators (✓✓✓)
- This serves as a direct subsidy where the effective price of energy-efficient electrical appliances will be lowered by $300 → this increases the willingness and ability of consumers to purchase these electrical appliances → DD and thus equilibrium quantity will increase.
- As consumers purchase these energy-efficient electrical appliances → they switch away from / replace energy-inefficient electrical appliances.
- This will decrease the complementary/derived demand for electricity from DD_0 to DD_1. At P_0, Qd<Qs(Q0) leading to a surplus and a downwards pressure on price for electricity where price decreases from P_0 to P_1, alleviating the increase in electricity prices for households.

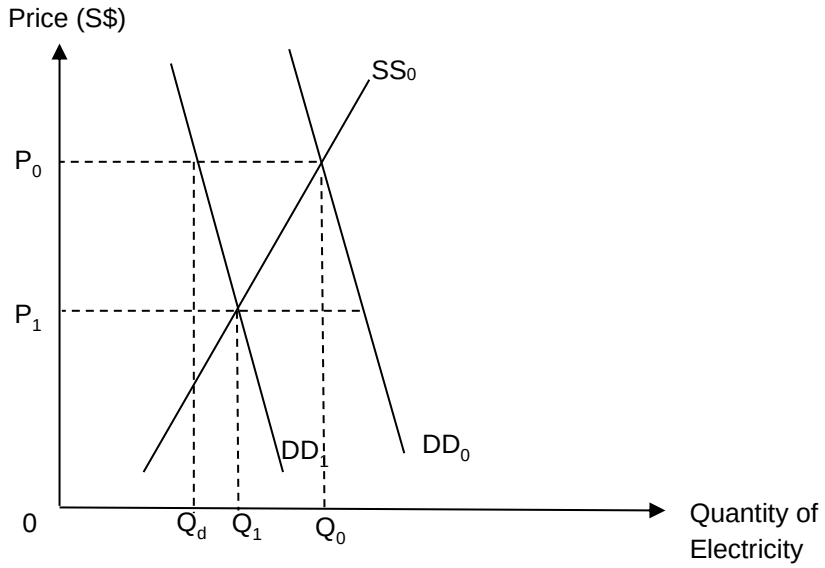


Figure 5: Market for Electricity

- Given that the supply for electricity is price inelastic as explained in part (a), the decrease in demand would lead to a significant decrease in price of electricity to clear the surplus since producers are less responsive to changes in price, making the policy highly effective.

Anti-thesis: Limitations of climate vouchers

- Effectiveness:
  - The success of the policy in decreasing demand depends on the household take-up rate of using the climate vouchers and the amount of climate voucher given, which is $300 per household. Many households may not utilise the climate voucher, especially the low income households as electrical appliances, such as air-conditioner or refrigerator is a big ticket item and the use of $300 vouchers to offset the purchases may still require households to spend out of pocket money to top up for the remainder price. Hence, the take-up rate may be low and the extent of decrease in demand for electricity may be insignificant.
  - It may also not be effective as consumers are unlikely to replace appliances that are still in good working condition → ineffective in the short run.

- While the climate vouchers may incentivize the consumers to switch to energy-efficient electrical appliances, it may increase the number of electrical appliances owned by households as consumers may purchase more appliances instead of phasing out the less energy-efficient one. This leads to an unintended consequence of increasing the derived demand for electricity instead.

- Feasibility:
  - The climate vouchers require government expenditure → this may impose a burden on government funds resulting in opportunity cost that could be spent in other areas such as education and healthcare.
  - May not be sustainable in the long run due to the cost involved.

Conclusion and Overall Evaluation:

- **Comparison of policies: "better"**
- **Students should look at at least 2 areas of comparison**

Whether removing the carbon tax or issuing climate voucher is a better policy to manage the rising electricity prices depends on:

- Certainty of outcome: Most producers will respond to the removal of carbon tax to increase the supply and therefore lead to a fall in price of electricity, whereas consumers take up rate of the climate voucher depends on the consumer's receptiveness and take up rate may be lower. Thus, removal of carbon tax is more effective in decreasing price of electricity than climate vouchers.
- Time period: If the government wants to reduce the price of electricity quickly in the short run, carbon tax removal may be a better policy as with the removal of carbon tax there will be a fall in the price of electricity due to the price mechanism in the free market. However, climate voucher is less effective in decreasing price of electricity in the short run as it takes time for consumers to change their taste and preferences towards energy-efficient electrical appliances and some consumers may not switch as their existing electrical appliances are still working well.
- Extent of impact on environment in the long run: The removal of carbon tax will lead to rising carbon emissions and rise in welfare loss, and worsens the climate change problem. On the other hand, the climate voucher encourages the switch to energy-efficient electrical appliances which can help to reduce demand and hence quantity of electricity used in the long run. This helps to reduce negative externalities and reduce welfare loss, and alleviate the worsening climate change problem. Hence climate voucher is better in terms of environmental sustainability in the long run.
- Feasibility: note that both the removal of carbon tax and climate vouchers will impact government budget negatively → can compare the extent as long as you are able to justify.

Suggestion of an alternative policy: Since carbon tax tackles the rising cost of production, whereas climate voucher tackles the rising demand of electricity, the government can use a combination of policies together with other complementary policies such as looking for cheaper sources of natural gas and encouraging good energy-savings habits through education campaigns to increase the overall effectiveness of alleviating rising electricity prices.

Mark Scheme:

Knowledge, Application, Understanding, Analysis		
L1	- *Conceptual inaccuracies* - *Lack scope and balance e.g. only 1 policy explained* - *Descriptive response that lacks use of economic framework in analysis*	***1-4***

L2	- *Discussion of policies with gaps in analysis* o *Explained only RI or R2 with limitations* o *Explained R1 and R2 but no limitations* o *Insufficient depth in explanation of the workings of the policies*	***5-7***
L3	- *Balanced arguments with good scope and depth of discussion* - *Good use of economic framework in analysis with clearly illustrated diagrams* - *For AT – if only looked at effectiveness OR desirability OR feasibility – max 8m*	***8-10***
Evaluation		
E1	▪ *An unsubstantiated judgement that is relevant – only R1 or R2 or summative*	***1-2***
E2	▪ *Judgement that is supported by a valid reason – R1 or R2 + summative*	***3-4***
E3	▪ *A well substantiated judgement on the impact of the policies in terms of effectiveness/desirability/feasibility – R1+R2+summative for 5m*	***5***

Examiners' Report

- *This part of the question was generally well attempted where the majority of the students had a well-structured response, supported by well-drawn diagrams, and a balanced answer with T-A arguments. However, a handful of students did not manage to complete the essay due to poor time management.*
- *Gaps in the discussion of removal of carbon tax*
  - *Far too many students did not even define what a carbon tax is and why the removal of the tax will impact the electricity market.*
  - *Some students illustrated the MSB/MSC framework and forgot that the focus of the question is on reducing the price of electricity and not about market failure.*
  - *Limitations where poorly elaborated – should link it back to the diagram to show the loss of tax revenue or the welfare loss due to over-production of electricity.*
- *Gaps in discussion of climate vouchers*
  - *A fair number of students misinterpreted the effects of climate voucher. Some incorrectly explained climate voucher as an indirect subsidy, increasing supply of appliances. Others incorrectly explained climate voucher increasing consumer's purchasing power to increase demand for electricity. Note that climate vouchers are given for energy-efficient electrical appliances and <u>not</u> electricity.*
  - *The policy of direct subsidy for energy-efficient electrical appliances was poorly elaborated. Many simply stated that people will buy these appliances without explaining why and went straight to the demand for electricity.*
- *There are a number of students with poorly developed and mostly theoretical limitations without any attempt to apply it to the context of electricity market. For e.g. The limitations mainly explains the cost to the government in terms of loss of tax revenue for carbon tax removal and cost incurred due to government financing the climate vouchers. There should be consideration of other aspects such as effectiveness, feasibility, desirability etc to increase the breadth of analysis.*
- ***Evaluation was poorly done for this question as students generally lack a common basis for comparison and the use of comparative terms like 'however, whereas, on the other hand' to show comparison** of the policies using a common factor. E.g. Certainty in the outcome of policies, impact on environmental sustainability in the long run etc. These students merely rehashed their responses highlighting the benefits and limitations of each policy again without clear comparison established to justify why one policy is better than the other. Some students also used a general statement of a combination of policy should be used or provided suggestion of alternative policy such as public education without first addressing the question of which policy is better.*

2 From pharmaceuticals to smartphones, governments grant patents to reward firms in many industries for their innovative ideas, thereby enhancing firms' monopoly power. At the same time, governments also use antitrust laws to prevent large corporations from monopolising markets.

(a) In the absence of government intervention, explain why some industries are more competitive than others and some industries are more innovative than others. [10]

(b) Discuss whether reducing the number of patents granted is the most appropriate policy measure to improve consumer outcomes in the pharmaceutical industry. [15]

Part (a)

Introduction

- Establish what is meant by "competitive" and "innovative"
  - Competitiveness: extent of competition within an industry usually determined by the number of firms, which determines how firms interact with each other
  - Innovative: development of new processes and/or new products

R1: explain why some industries tend to be more competitive than others due to the lower barriers to entry and higher number of firms competing.

- The hawker stalls industry operating under monopolistic competition tend to be more competitive, with **more firms in the industry**, due to the lower barriers to entry than the pharmaceutical industries under a competitive oligopoly **with less firms in the industry**.
  - There are very low natural barriers to entry into the hawker stalls industry. For instance, it is relatively easy and cheap to rent a stall, procure the cooking equipment, hire manpower and purchase the raw ingredients to start up a hawker stal
  - If the hawker stalls are making supernormal profits in the short run, new firms can easily enter the market in the long run and compete with incumbents, resulting in many small stalls in the industry, each with low price setting abilities and market share.
  - **On the other hand**, there are much higher structural barriers to entry into the pharmaceutical industry. The startup costs can be prohibitively high because a potential entrant will need to have enough financial capital to pay for the expensive research equipment, hire highly educated and experienced lab researchers, build production factories with strict hygiene and sanitation standards and so on.
  - Such high startup costs mean that pharmaceutical companies can benefit significantly from operating at a large scale and reaping cost savings from internal economies of scale (EOS). For instance, big pharma companies can buy chemical ingredients and other raw materials from suppliers in bulk and enjoy high bargaining power. They are more likely to be offered discounts and preferential treatments by their suppliers, leading to lower long run average costs of production due to marketing EOS.
  - While potential entrants may be attracted by the high supernormal profits present in the pharma industry, they will find it difficult to enter the market and compete. New entrants with lower outputs will face a much higher average cost of production than the incumbents due to inability to reap the full extent of internal EOS. To make a profit, they must charge a higher price for their drugs, lowering their chances of attracting consumers away from incumbents, reducing their expected profits and deterring them from entering the pharma industry.
  - As a result, only a few large pharma firms dominate the global industry, each with very large market share and high price setting abilities to charge a price above their marginal costs of production.
  - ⇨ With fewer firms in the market, the pharma industry is less competitive than the hawkers industry.

- *Alternatively, students can also explain <u>strategic barriers to entry</u> into pharmaceutical and smartphone industries.*
- *For example, incumbent pharmaceutical firms can set up high strategic barriers to entry by consistently investing in and deepening their R&D into new drugs or improving efficacy for existing drugs. New entrants with less financial capital available will find it hard to come up with drugs that are comparable in effects. As a result, new entrants will find it hard to gain consumer demand and revenue, lowering their expected profits and deterring them from entering.*
- *In a similar vein, incumbent smartphone companies can set up strategic barriers to entry by spending on large scale advertising campaigns to increase consumers' demand and loyalty for their phones. This makes consumers less willing to switch to buy phones produced by new entrants. As a result, new entrants will find it hard to gain consumers and revenue, lowering their expected profits and deterring them from entering the market.*

Note: An acceptable alternative, <u>but less recommended</u>, approach to R1 "explain why some industries are more competitive than others" is to "explain why MPC and oligopolistic industries are more incentivized to use price and non-price strategies to compete than PC and monopolistic industries".

- Hawker stalls, operating under MPC market structure, and smartphone companies, operating under oligopolistic market structure, are more incentivized to compete using price and non-price strategies due to the presence of competitors in the market.
- For example, hawkers engage in low-cost advertising via passing out printed flyers at public transport interchanges or posting on social media platforms to increase their reach to customers. Many also display newspaper cuttings of good reviews of their food at stall front to increase the perceived quality of their meals.
- If successful, they can increase the demand for their meals and decrease the substitutability of their meals, leading to a higher AR2 and MR2 and lower PED.

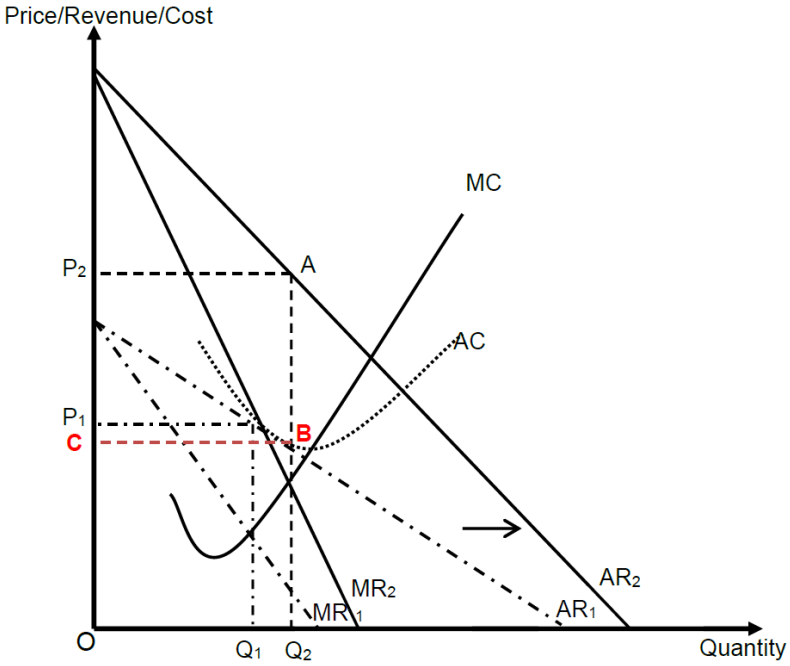


Figure 1: increasing profits from strategies

- At Q2, the new profit maximizing quantity where MR2 = MC, the hawkers will enjoy higher supernormal profits in the short run, incentivizing them to compete using non-price strategies.

OR

- Smartphone companies may sometimes engage in fierce price competition by initiating a price war.
- There is high mutual interdependence among the few large firms like Apple, Samsung and Huawei dominating majority of the smartphone market. Any actions taken by Apple could significantly affect the profits of Samsung and Huawei if they do not readily respond, leading to high rival consciousness amongst these smartphone producers.
- In times of changing demand or technological progress, sometimes the large incumbent phone makers may voluntarily start a price war in hope of driving out existing competitors to consolidate more market power.
- For example, Apple may engage in predatory pricing by temporarily offering a price below their average costs of producing its iPhones. Although it may make subnormal profits in the short run, it may survive these subnormal profits to a longer time than other smaller competitors due to its high retained profits from past sales and its higher market dominance.
- In the long run, loss making competitors will have no choice but to exit the market. Apple can then enjoy higher demand and lower substitutability for its iPhones, increasing their profits and market power in the long run *[you may link to Figure 1 to explain in detail].* Thus, smartphone companies are incentivized to compete using price strategies sometimes.

COMPARED TO

- On the other hand, the wheat farming industry under perfect competition does not have much incentive to compete using strategies.
- With numerous numbers of small farmers selling identical wheat and having zero barriers to entry, each wheat farmer does not have any price setting abilities. Wheat farmers are price takers in the market and cannot compete using price strategies.
- They also do not have incentives to compete using non-price strategies because there is perfect information in the market. Consumers know fully that all wheat are the same no matter how much advertising or perceived differentiation is done. All wheat farmers also know each other's production methods and costs, making any process innovations replicable by others. Thus, costly non-price strategies will only add to cost but not to revenue, leaving farmers no incentive to compete.

OR

- On the other hand, a monopolist in electricity generation do not have any incentive to compete using strategies due to absence of competitors and low contestability in the market.
- This is due to the prohibitively high startup costs. The electricity producer will need to lay the power grid over the entire country, connect electricity wiring to all households and businesses, set up expensive power generators and so on.
- As a result, the firm often is a natural monopoly where there is so much long run cost savings to be gained from spreading the high startup costs over larger and larger outputs that the industry's minimum efficient scale of production is higher than the entire market demand.
- Thus, the market demand can only efficiently support the presence of one single large firm and no new firms can afford to pay such expensive startup costs to enter and compete.
- Due to the lack of competition and low contestability, the natural monopolist will not be incentivized to compete using price or non-price strategies as that just add to costs or losses, rather than revenue and profits.

R2: explain why some industries tend to be more innovative than others using any one of the following factors:

Possible factor 1: difference in ability to innovate:

- Successful innovation in the form of product or process innovation takes lots of time and resources. For example, some estimates suggest that to develop a new medicine, the pharma companies need to spend millions or even billions of dollars.
- Given this high cost of innovation, only firms in oligopolistic and monopolistic industries can have sufficient retained profits to spend on and sustain innovation in the long run.
- There are high barriers to entry in the pharma industry as explained earlier, giving firms the ability to sustain supernormal profits in the long run and spend millions of dollars on innovating their drugs.
- On the other hand, due to the much lower barriers to entry into hawker stalls industry, any short run supernormal profits earned by the hawkers will be eroded by new entrants in the long run as shown in the diagram below.

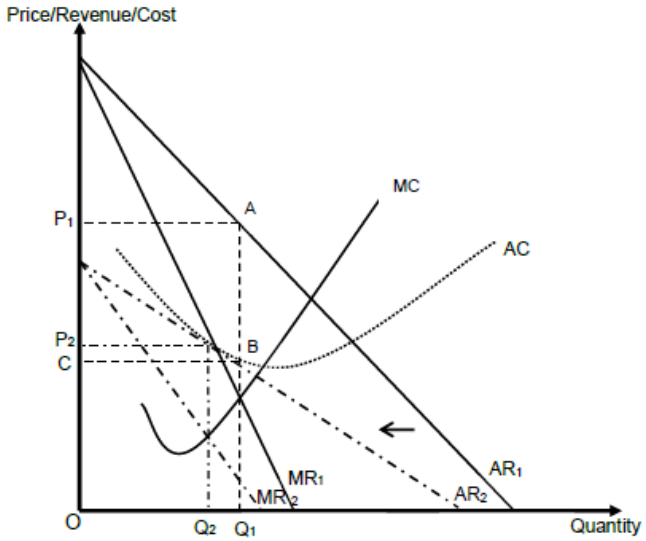


Figure 2: long run adjustments in MPC market, leading to normal profits

- Attracted by the available supernormal profit of area P1ABC, new hawkers will easily enter the market in the long run. This will decrease the demand for existing hawkers and increase the substitutability of their food as there will be more stalls competing.
- As the AR and MR fall to AR2 and MR2 respectively, the hawker stall will now profit maximise at a lower quantity at Q2 where MC=MR2 rather than at Q1 where MC=MR1. The price also decreases to P2 where the hawkers will now make normal profits in the long run, reducing their ability to spend on expensive research and development projects to innovate.
- Thus, oligopolistic industries like pharmaceuticals are more innovative than hawker stalls industry under monopolistic competition because they have higher ability to pay for innovation.

OR Possible factor 2: difference in incentive to innovate:

- Firms in oligopolistic industries, such as the smartphone industry, have more incentive to compete using non-price strategies such as product and process innovation than firms in MPC markets.
- Under an oligopolistic structure, there is high mutual interdependence among the few large firms like Apple, Samsung and Huawei dominating majority of the smartphone market.
    - Any actions taken by Apple could significantly affect the profits of Samsung and Huawei if they do not readily respond, leading to high rival consciousness amongst these smartphone producers.
    - As a result, the smartphone companies tend not to compete using price competition as any price increases initiated by one firm will not be followed by other firms, leading to a more than proportionate decrease in quantity demanded and loss of revenue. On the other hand,

any price cuts initiated by one firm will likely be met with similar price cuts by other firms, leading to a less than proportionate increase in quantity demanded and loss of revenue.
    - Even worse, if the firms take the price cuts as a signal of the start of a price war, they will continue to undercut each other's price. In the short run, all firms face lower profits (even subnormal profits). To prevent price wars, oligopolies tend to keep their prices rigid, and they are more incentivized to compete using non-price competition strategies such as product and process innovation instead.
    - For example, Apple's product innovation to make their iPhones faster, more secure and better AI-empowered can help to increase consumers' demand for iPhone and make them more loyal to Apple because the consumers may find iPhones less substitutable and more superior than other phones. Apple will thus enjoy higher expected profits, increasing their incentive to innovate *[you may illustrate with a diagram]*.
    - Furthermore, due to the high degree of imperfect information, Apple's innovation may not be readily copied by potential entrants, giving Apple the ability to raise the barriers to entry into the market and to retain supernormal profits in the long run. This further increases Apple's incentive to innovate.

- On the other hand, the incentive for hawkers to innovate can be more limited. Although there is also imperfect information regarding the methods of cooking, the recipes of each hawker and the best source of buying high quality but affordable food ingredients, the degree of imperfect information may be lower than that in smartphone industry.
    - Thus, one hawker stall innovating on its recipes may find their recipe easily replicated and copied by other hawkers, decreasing their incentive to innovate.
    - Furthermore, even with innovation, hawker stalls can only command a small market share and earn normal profits in the long run due to the low barriers to entry into the market *[insert brief explanation. See example under factor 1: differences in ability to innovate]*. They will thus have less incentive to innovate in general.

- Thus, oligopolistic industries such as the smartphone industry are more innovative than hawker stalls industry under monopolistic competition because they have higher incentives to innovate.

OR <u>Possible factor 3: difference in nature of industry leading to different incentives to innovate:</u>

- Firms in pharmaceutical industries tend to be more innovative than firms in other industries due to the nature of their industry.
- This is because the very survival and growth of pharma companies in the long run depends on their continuous efforts and investments into research and development which leads to product innovation in the form of new and better drugs.
    - Product innovation to pharma companies is not a "good to have" strategy but rather a "have to have" strategy. For example, during the covid-19 pandemic, pharma companies like Pfizer and Moderna had to innovate quickly and develop the more effective vaccines and boosters to quickly capture the global market and earn profits.
    - The rapid and successful innovation led to an increase in the demand for such pharma companies and a reduction in substitutability because of higher quality of their vaccines.
    - As AR and MR increases to AR2 and MR2 respectively in Figure 1 above, the firms can increase their profits from normal profits to a supernormal profit of area P2ABC at the new profit-maximising price P2 and quantity Q2 where MR2 = MC, incentivizing them to innovate.
    - For firms who did not manage to develop the vaccines in time or developed a sub-par vaccine, they would quickly get outcompeted by other more innovative competitors.
- This, however, can be very different for hawkers. Sometimes innovations in recipes can be taken to be undesirable by the hawker consumers.
    - For instance, many consumers tend to be very loyal to the hawker stalls that offer cuisines reminding them of "taste of home cooking" and recipes that "never changed from decades ago". Even worse, innovations in recipes may sometimes be disliked by loyal customers, making many hawkers less incentivized to innovate. Since staying with "the recipe" can

guarantee a constant stream of customers and profits while innovating may hurt demand and profits, hawkers will be less likely to innovate.

- Thus, industries such as the pharmaceutical industry are more incentivized to innovate than hawker stalls because of their different nature of the products.

Mark Scheme:

Knowledge, Application, Understanding, Analysis		
L1	- *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* - *Contains fundamental conceptual errors in analysis*	***1 – 4***
L2	- *An explanation of at least* o *1 form of BTE that led to some industries being more competitive than other industries* o *1 reason for why some industries are more innovative than other industries* - *For R1: an explanation for at least* o *2 industries one with higher BTE and one with lower BTE to compare* o *Different levels of BTE with examples* o *How the BTE affects expected profits for potential entrants if they enter, hence influencing number of firms entering and level of competition* - *For R2: an explanation for at least* o *2 industries one being more innovative and the other less so* o *One reason affecting either the incentive or the ability or the necessity to innovate for some industries* - *Demonstrates some application of economics concepts or framework but there are some gaps in economic analysis*	***5 - 7***
L3	- *Answer is rigorous and shows detailed economic analysis with the use of economic framework.* ➢ *Clear analytical structure to the answer* ➢ *Relevant and accurate understanding and explanation of economics concepts required* ➢ *Good use of real-world examples to support the analysis*	***8 - 10***

Examiners' comments:

- *The response to part (a) of this essay was much weaker than the response to part (b).*
- *Some students misread the question and instead attempted to answer some <u>self-created questions</u> such as:*
  - *"explain why some industries are more competitive than innovative"*
  - *"explain why some industries are more price competitive but less innovative than others"*
  - *"explain why some industries are more price competitive than non-price competitive than others", etc.*

  ➔ *Note that none of the above are exactly what the question is asking for. It is important for you to read and interpret the question carefully and accurately before start writing.*
- *Several students explained the presence of statutory barriers to entry in the form of patents at length for part (a). This was not acceptable because the question is "in the absence of government intervention".*
- *Some students explained an entirely one-sided answer without comparing between industries. For instance, some students explained how MPC firms are competitive because they face low barriers*

to entry and how oligopolies are innovative due to ability to make supernormal profits in the long run. However, without explicit comparison between industries, the question requirements will not be fully addressed.

- *There were many scripts which lacked application to "different industries". These answers did not score well as the answer simply compared different market structures rather than different industries.*
- *There was also a general lack of application where students did not use examples of BTEs or types of innovation in the different industries.*
- *While acceptable, it is <u>not recommended</u> for students to interpret "more competitive" in this question as "firms using strategies to compete". The reason is because students who took this approach often provided explanations that were:*
    - *Poor in organization and clarity of ideas. Some even ended up concluding that "MPC firms are less competitive than monopolies" which was unacceptable. Note that monopolies will still have high BTEs even when they are contestable.*
    - *Some students seemed to believe that price competition is more competitive than non-price competition. While price war may seem more intense than advertising, it is important to remember that all forms of competition are competitive in nature. As much as predatory pricing can drive out competitors from a market, aggressive advertising can too.*
- *Lastly, some students spent way too much time and effort on part (a), leaving insufficient time for part (b). Time management is important.*

Part (b)

Introduction:

As mentioned in part (a), the pharmaceutical industry is oligopolistic in nature.

- There are a few large dominant firms like Pfizer, Johnson & Johnson, and Sanofi competing in the global pharma market. The strategic and statutory barriers to entry are high. Information on how to develop and formulate the differentiated medicines by each company and the most efficient method of production is imperfect.
- Each firm also specializes in production of different types of products, from flu drugs and depression pills to vaccines.

To improve consumer outcomes, it would be good to increase yardsticks like:

- affordability (by lowering prices)
- accessibility (by increasing quantity available)
- product quality (through research and development)
- consumer choice (by allowing variety of sellers and products)
- and consumer surplus in their consumption of the pharmaceutical products.

R1: Discuss how reducing number of patents → improve consumer outcomes

R: Thesis: explain how reducing the number of patents granted can lower strategic barriers into the market, increase competition and lead to lower prices for medicines, increased consumer choice and welfare.

- When the government reduces the number of patents granted, the incumbent pharma companies will have less monopoly power over the medicines that they researched and developed.
- This lowers the statutory barriers to entry into the pharmaceutical industry as potential entrants will find it easier to replicate, develop and sell similar medicines as the incumbents, now that the formulae and method of production for the medicines are less monopolized by the incumbents with patents.

- New firms will be more incentivized to enter the pharma industry as their expected profits from entering will be higher now that they can sell medicines similar to the incumbents to attract consumers and earn revenue.

- As the number of competitors increases, the demand for each incumbent firm's medicines will fall and the substitutability will also increase due to more close substitutes available on sale now by the new entrants.
- This leads to a fall in AR and MR curves from AR1 and MR1 to AR2 and MR2 respectively in the diagram below. The curves will also become flatter as the PED for the incumbent firm's medicine increases.
- Originally, the incumbent firm was profit maximizing at a quantity of Q1 where MR1=MC and charging a price of P1 to the consumers for their medicines sold. However, with more new entrants entering and competing, the incumbent firm will now profit maximise at a lower quantity of Q2 where MR2=MC instead. The price at Q2 also falls from P1 to P2.

- The medicines once monopolized and patented by a few firms will now become more affordable to consumers. Even the lower income households are now more able to afford the medicines, making distribution more equitable.
- While each firm's outputs may fall from Q1 to Q2, the industry's overall output level may increase due to the increased number of companies producing. Thus, with more medicine available at cheaper prices, consumer surplus and welfare in the market likely increases.
- There will also be more consumer choices in terms of which pharmaceutical companies' products to buy as different firms may offer medicines with different dosage levels, potency and price range.

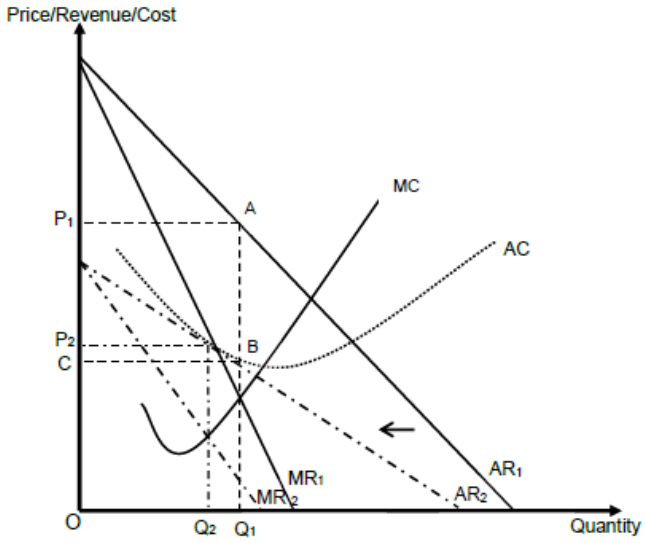


Figure 2: effects of reducing number of patents granted on a pharmaceutical firm

R1: Anti-thesis: explain how reducing the number of patents granted can, however, lower the level of supernormal profits earned by each pharmaceutical company, reducing their ability to innovate, despite higher incentives to innovate.

- However, when more firms enter, the profit levels of each incumbent will fall from area P1ABC to normal profits, making the firms less able to pay for expensive research and development projects to come up with newer and better-quality medicines over time.
- More importantly, the reducing number of patents would likely reduce the incumbent firms' incentive to spend on innovating their drugs as their drug formula can now be easily replicated by other firms.

- This reduces consumer welfare as the quality and variety of the medicines may be sacrificed with less product innovation. The price of the medicines may also remain high with the firms conducting less process innovation to make their production processes more efficient and less costly.

- *Alternatively, students can also consider iEOS and rising prices of medicine:*
    - *As each pharmaceutical firm produces a lower output level at Q2 instead of Q1 in Figure 2, in the long run, the firm will be operating at a smaller scale of production.*
    - *This leads the firms to enjoy and reap less internal EOS, such as marketing EOS. With lower ability to purchase ingredients and equipment in bulk, the suppliers will offer lower discounts to each pharmaceutical companies, increasing the firms' long run average costs of production.*
    - *The firms may end up passing the increased costs to consumers in terms of higher prices, making the medicines less affordable.*

R2: Discuss another policy measure → improve consumer outcomes in the pharmaceutical industry

Any of these policy measures are accepted: 1. Antitrust laws (need to choose one example for detailed analysis) 2. Price regulation, either AC or MC pricing 3. Indirect subsidy to encourage research and development, etc.

<u>Option 1: Antitrust laws:</u>

Thesis:

- The government can strengthen its anti-trust laws to promote more competition by stepping up regulations on any potential anti-competitive behaviours by pharma companies, such as collusive or predatory pricing, blocking or preventing merger and acquisition deals, and so on.
- For example, GSK was formed by the merger between two smaller companies in the early 2000s. Should the government judge such mergers to be too harmful for consumer welfare due to consolidation of monopoly power, the government could potentially block or even break up mergers.
- If that happens, the firms will face lower demand and a higher number of competitors, making their products more substitutable, resulting in a similar effect as reducing the number of patents explained earlier in Figure 2. The prices will fall to P2, making the medicines more affordable to consumers.
- With more firms competing, variety will likely increase too. Firms may also become more incentivized to innovate to differentiate their products from the competitors, giving consumers more choices and potentially better-quality medicines.

Antithesis:

- On the other hand, as the profit levels of each incumbent will fall from area P1ABC to normal profits, making the firms less able to pay for expensive research and development projects to come up with newer and better-quality medicines over time.
- Furthermore, it may be difficult for the government to judge if a merged firm is truly harmful to consumer welfare given that the larger firm can potentially reap higher iEOS to pass on cost savings to consumers as lower prices in the long run.
- Such a policy may also be administratively difficult and politically unpopular because merger deals usually cost firms lots of money to carry out and reversing a merger will be hard to be convincing for such firms. Some firms may even go to the extent of lobbying and bribing political leaders to circumvent such anti-trust laws, making the enforcement challenging in many countries.

Option 2: Price regulation, e.g., AC pricing:

Thesis:

- To increase the affordability and availability of medicines to consumers, the government can directly regulate the price of the medicines by requiring the pharma companies to charge a price equal to their average costs of production.
- As shown in Figure 4 below, each pharma company will charge a price at P2 where AR = AC at quantity Q2.
- With AC pricing, the consumer outcomes will improve as there are now more medicines available at Q2 (rather than Q1 where MC = MR) at a more affordable price at P2 (rather than P1). Consumer surplus and welfare thus increases.

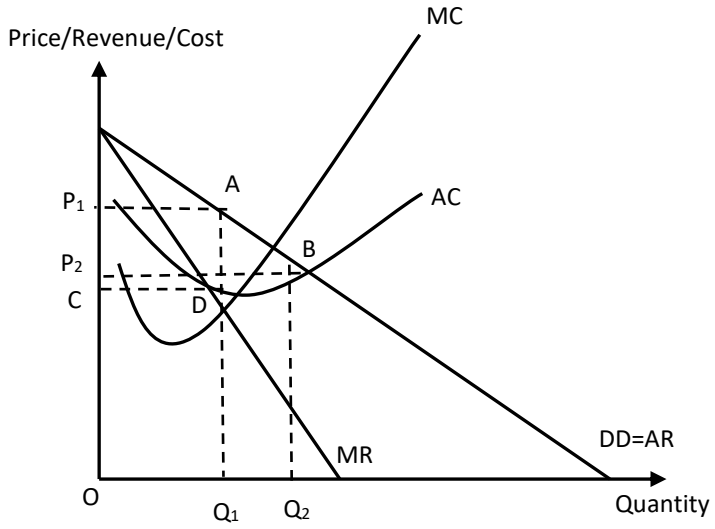


Figure 3: effects of AC pricing by a pharma company on consumers

Antithesis:

- On the other hand, the supernormal profits of area P1ADC to the pharmaceutical companies will be completely reduced to normal profits as AR = AC at P2 and Q2.
- The fall in profits lowers the pharma companies' ability to spend on expensive research and development projects to bring about product and process innovations, similar to the effects explained for reducing number of patents granted.
- This reduces consumer welfare as the quality and variety of the medicines may be sacrificed with less product innovation. The price of the medicines may also remain high due to lack of process innovation.
- Another limitation to AC pricing is that it would be administratively difficult and challenging for the government to monitor whether the pharmaceutical companies are truthfully disclosing their true average costs of production and charging the prices accordingly. The firms may withhold or distort information by overstating its costs so that it can charge a higher price than P2, gaining more revenue and profits, limiting the extent of increased affordability to consumers.

Option 3: Indirect subsidy to encourage research and development

Thesis:

- As mentioned in part (a), the survival and growth of pharmaceutical firms depends on their continued efforts to come with new drugs and improve on existing ones through research and development projects on product innovation.

- Thus, consumer outcomes also depend heavily on how much R&D projects are initiated and successful. Consumers value better and more effective medicines for their needs.
- As such, instead of reducing the number of patents granted, the government may want to further encourage the firms to deepen their product innovation by offering them conditional indirect subsidies to cover part of their variable production costs, if the firms continue to spend on R&D.

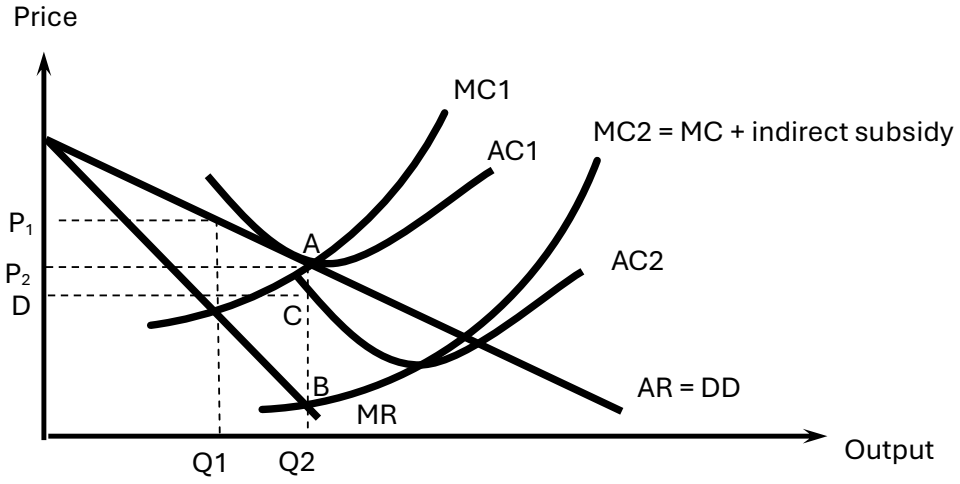


Figure 4: effects of indirect subsidies on R&D to pharma companies on consumers

- As shown in Figure 4, when the government gives a per unit subsidy of AB amount to the pharma firms, the AC and MC of the firm will fall from AC1 and MC1 to AC2 and MC2 respectively.
- At the new profit maximizing quantity Q2 where MR=MC2, the price will fall to P2, making the medicines more affordable to the consumers as the firms pass on some cost savings to consumers. The quantity available is also higher, increasing consumer surplus and welfare.
- Since the subsidy is conditional on the continued R&D by the firms, consumers will also benefit from higher quality and variety of medications from product innovation and possibly lower prices in the long run due to process innovation.

Antithesis:

- The main limitation is that such subsidies may further increase the market power by firms and their profits from normal profits in Figure 4 to supernormal profits of area P2ACD.
- Consumer outcomes may thus not be improved as much as what the government desires because the incumbents may not end up using all (or most of) the increased profits to innovate and come up with better products but to further protect their market share by setting up higher strategic barriers to entry via advertising.
- The firms may also become complacent and become x-inefficient in their production, leading to rising costs and passing that onto consumers as rising prices in the future.
- The subsidies are also expensive for the government, leading to high opportunity costs because the money spent on these subsidies could be used to subsidise universities to educate new batches of medical and pharmaceutical science students important for continued development of the industry.

Conclusion and Evaluation:

Note: This is just an example. You can evaluate in many ways but applying the context of the pharma industry and answering to the question is important

- **Weigh:** Reducing the number of patents granted seems to be a more appropriate policy measure than AC pricing. Although both measures increase affordability and accessibility of the medicines to consumers, reducing number of patents granted has the added benefits of encouraging more firms to enter and injecting higher level of competition in the pharma industry to boost consumer choice.
- This can be very important given the nature of pharmaceuticals as a product. There is no sure cure for any diseases and different patients react to different medicines differently, making differentiation and variety valuable and important. For example, while most patients can eat Stripsils to sooth their sore throat, some patients may be allergic to some ingredients in Stripsils and had to choose other brands. Thus, consumer choice is an important factor in judging which policy is more appropriate in pharmaceutical industry.

- **Suggest:** To further improve on the policy measure on patents so that firms can continue to have the ability (and the incentive) to innovate, the government can consider shortening the time granted before patent expiry, rather than completely not granting the patents. This way the incumbents will have a shorter period that they can monopolise the sales and production of a patented drug while still reap substantial amounts of supernormal profits before patent expiry to sustain their ability to innovate.
- Alternatively, the government can combine reducing number of patents granted with temporary indirect subsidies to firms so that they can maintain higher ability to innovate. For example, during the covid-19 pandemic, many governments are working closely with private pharmaceutical companies in the developments of the vaccines and sometimes that involved indirect subsidies to these big pharma companies to cover part of their costs so as to speed up the research progress.

- All in all, despite being the more appropriate measure, there are modifications and adjustments that the government should make than just purely reducing the number of patents granted.

Mark Scheme:

Knowledge, Application, Understanding, Analysis		
L1	- *Response is not relevant to the question – no discussion on the impact on the consumers – in terms of price, availability, choice, quality or any other outcomes* - *Conceptual inaccuracies* - *Lack scope and balance*	***1-4***
L2	- *Explanation of two policies and its impact on consumers has gaps, e.g., weak linkage to consumer outcomes* o *Explained only RI or R2 with limitations – max 6m* o *Explained R1 and R2 but no limitations – max 7m* o *If no context throughout (not even in evaluation) – max 7m*	***5-7***
L3	- *Balanced arguments with good scope and depth → Explained removing patents and one other policy with its impact on consumers*	***8-10***
Evaluation		
E1	▪ *An unsubstantiated judgement that is relevant – only R1 or R2 or summative*	***1-2***

E2	▪ *Judgement that is supported by a valid reason – R1 or R2 + summative*	***3-4***
E3	▪ *A well substantiated judgement on the impact of the policies on consumers and producers – R1+R2+summative for 5m*	***5***

Examiners' comments:

- *For students who had enough time to complete part (b) of this essay, this was usually the better-done part of the question. For students who did not have enough time to complete part (b), it was generally harder to score well for this question.*
- *Some students did not provide clear measures of consumer outcomes, such as affordability, consumer surplus, and so on. Some students just discussed generally about allocative and productive efficiencies without linking back to outcomes that consumers care about. Please note that consumers do not directly care about AE and PE.*
- *Some students simply stated reducing number of patents can increase consumer surplus and equity, without clearly explaining what it means by CS and equity.*
- *In discussing R1 on patents, some students did not understand/offer a clear explanation of how patents work:*
    - *Some students mistook patents as entry permits into an industry and wrongly argued that reducing the number of patents will reduce the number of firms which can compete in the market.*
    - *Some students argued simply that when more firms were able to replicate incumbents' research results and more able to enter the market, the increased level of competition will drive more innovation. However, this missed the idea of how patents work and that firms should be less incentivized to innovate if any ideas are more easily copied by others.*
- *In discussing R2 using anti-trust laws, many students did not utilize economic framework to support their explanation. It is important for students to choose one specific type of anti-trust laws and explain how it works in the pharma industry, rather than just generally state all types of anti-trust laws.*
- *The evaluation for this question was generally quite underwhelming, mainly because most students did not even mention the context of pharma industry and how different policies can work well (or not so well) in pharma industry. Some even talked about water and electricity industries in evaluation which was not in the context of the question.*

3 In central Mumbai, Dharavi slum is an overcrowded residential area with substandard housing. The government is looking to redevelop this slum by getting private developers to provide improved housing at a price of 250,000 rupees (USD 3000) per housing unit. It faces the challenge of convincing reluctant slum dwellers of the benefits of purchasing such housing which includes clean amenities for their families, less outbreak of contagious diseases and their children performing better at school.

Source: Adapted from CNN June 2024

(a) Explain two different reasons for market failure in the market for improved housing. [10]

(b) Discuss whether a government subsidy to housing developers or the provision of a housing loan to each family in Dharavi slum would better address market failure in the market for improved housing. [15]

Part (a)

Introduction:

- The market for improved housing in Mumbai fails to achieve an allocative efficient outcome because of the existence of significant external benefits of consumption and the existence of imperfect information amongst slum dwellers.

R1: Existence of significant external benefits of consumption

- Usage of clean amenities like clean sanitation reduces the frequency of outbreak of contagious diseases like cholera.
  - those living around the vicinity of the improved housing will be less exposed to outbreak of such contagious diseases and incur lower medical bills that are not compensated by the slum dwellers → other communities living in the nearby areas (outside of the improved housing complex) will not contract such diseases giving the densely populated city like Mumbai where infection/viruses can spread very rapidly
  - third parties, such as classmates in schools and colleagues at workplace, who come into contact with the slum dwellers living in the improved housing complex will also benefit as they are less likely to fall ill → contributing to greater productivity at work → higher incomes for those households in the future
  - businesses such as hotels, restaurants and shops around the improved housing complex will also benefit from higher profits with the overall development of the area since Dharavi is located near suburban/central Mumbai
  - there is less burden on healthcare institutions as medical staffs can be relieved to treat other patients with chronic illnesses instead of treating patients infected by the outbreak of the contagious diseases such as cholera in the improved housing complex → resources can be diverted elsewhere towards improvement of security with expansion of the police force and public transport network that will benefit entire Mumbai

Analysis with diagram

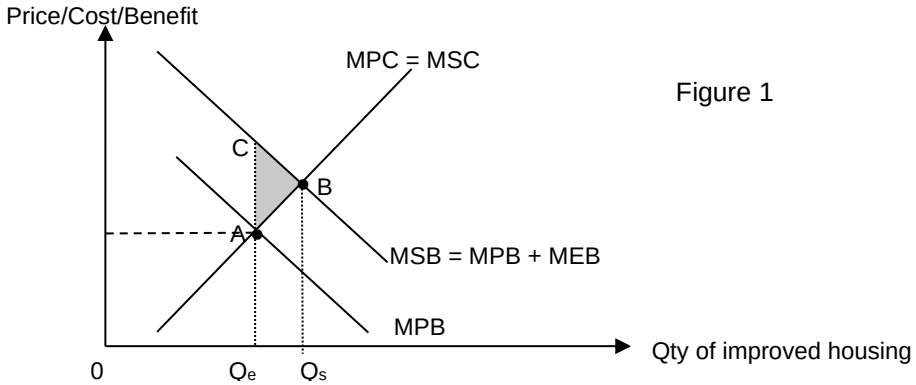


Figure 1

- As a result, there is a divergence between the marginal social benefit (MSB) and the marginal private benefit (MPB) for these households by the extent of marginal external benefit (MEB) of consumption of improved housing by slum dwellers as elaborated above, in figure 1.
- For which MPB of improved housing is the additional benefits derived from usage of clean amenities that come with consumption of an addition unit of such accommodation, like clean sanitation, access to cleaner water that enhances the quality of life due to lower frequency of outbreak of diseases in such a densely populated areas.

- The marginal private cost (MPC) reflects the opportunity cost of producing additional units of improved housing, this will be equal to the marginal social cost (MSC) as there is assumed, no external cost related to production of such housing.
- The private level of production and consumption occurs at Q_e, where MPB = MPC, as self-interested producers and consumers only take into account their own private costs and benefits. Meanwhile, the social optimal level of consumption occurs at Q_s, where MSB = MSC. Hence, the market fails to achieve allocative efficiency, as Q_eQ_s units of improved housing is under-consumed in the free market.
    - Consequently, the benefits forgone from not consuming Q_eQ_s is greater than the resources saved in not producing Q_eQ_s units of improved housing, resulting in a net benefit forgone to the society as represented by the deadweight loss area of ABC.

R2: Existence of imperfect information about the private benefits of improved housing

- For the proportion of slum dwellers who are reluctant to move away from substandard housing
    - The slum dwellers are generally poorly educated and are used to a low standard of living given their financial circumstances (reason for the imperfect information).
    - As a result, they are possibly ignorant of the long term private benefits of improved housing (actual/real benefits) such as the opportunity for their children to attend a school with better quality teaching facilities that may come with the development of improved housing complex in the neighbourhood → better access to education allows these children to learn skills that will inevitably lead to higher paying job in the future, potentially raising the household income. Furthermore, it will improve the safety of their children who may fall prey to delinquant behaviour in areas.
    - Furthermore, the slum dwellers are unaware of the medical cost savings they can enjoy from better health as they are less prone to falling ill to water-borne diseases due to cleaner amenities and loss in income for those on daily wages since most of them are working at odd jobs.

Analysis with diagram

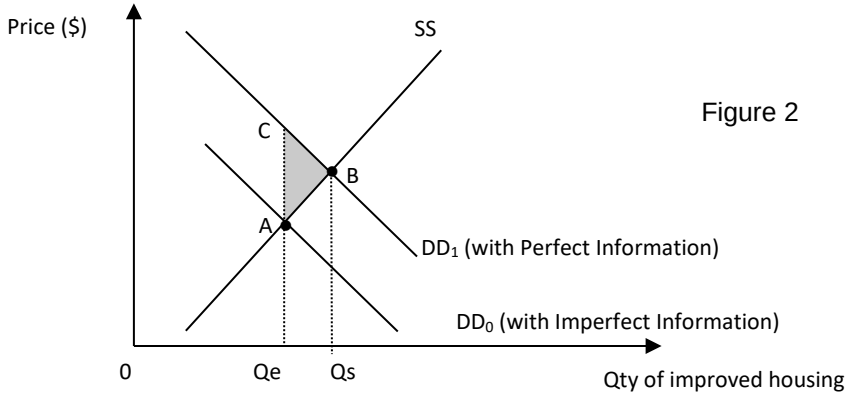


Figure 2

- According to figure 2, as a result of the imperfect information, a slum dweller will underestimate the actual benefits of relocating to an improved housing. Hence, the demand for improved housing will be lower at DD_0 with imperfect information where they only consider the perceived benefit of moving into an improved housing unit with cleaner amenities. However, with comprehensive and accurate information about the actual/real private benefits of consuming such housing will be at DD_1
- Hence, Q_e is the private level of consumption where DD_0 intersects with SS, and this is lower than the society's optimal level of consumption at Q_s, where DD_1 intersects with SS. This results in an underconsumption of Q_eQ_s units of improved housing.

- As a result, there is a deadweight loss of area ABC to the society which reflects net benefit foregone by from the underconsumption of improved housing.

Hence, the market for improved housing fails because of the existence of external benefits from consumption, and imperfect information.

Mark Scheme:

Knowledge, Application, Understanding and Analysis		
L1	• *For an answer that shows vague knowledge of the two sources of market failure* • *Significant conceptual gaps in explanation* • *No use of relevant economic framework applied.* • *Descriptive explanation of answers*	*1-4*
L2	• *Made clear reference to relevant economic framework.* • *For an answer that explains both sources of market failure though there are some gaps in explanation.* • *Used examples to demonstrate application with reference to the context of improved housing in India.*	*5-7*
L3	*A well-developed answer that demonstrates:* • *Rigorous analysis for both sources of market failure (external benefits and imperfect information).* • *Good application to market for improved housing throughout the essay.* • *Clear and comprehensive use of relevant economic framework*	*8-10*

Examiners' Comments

- *Majority of the students have understood the requirements of the question and done well for part (a). There was detailed and sequenced analysis regarding the two different reasons for market failure using relevant economics framework and examples to demonstrate application.*
- *However, some students did not manage to distinguish clearly the two sources of market failure, and often confused personal/private benefits with benefits accrued to third parties. As such, they were unable to explain the two different sources of market failure accurately.*
- *A large number of students did not manage to develop their analysis using relevant examples. Application was limited to quoting the preamble, without further elaboration on the examples of real/perceived private benefits and external benefits to the third parties who are living outside of the improved housing complex (the 'others').*
- *Students are also encouraged to link both the private and external benefits to monetary benefits that are quantifiable in monetary terms instead of limiting the examples to non-monetary benefits. While many students raised that children living in the improved housing will have increased protection from diseases and hence be able to attend school more regularly, they could not elaborate how that may translate into potential for higher income in the future.*
- *A large number of students did not label their diagrams accurately which resulted in a penalty in the overall markets. Students should take note of the following when drawing diagrams:*
    - *Title – market for improved housing*
    - *Quantity of improved housing (x-axis)*
    - *Price/Benefit/Cost (y-axis)*
    - *Label the curves accurately*
    - *Shade the deadweight loss area or make reference to it in the analysis accurately*

- *Students are strongly encouraged to make reference to the diagrams throughout their analysis. A large number of students did not define/clarify what the deadweight loss area means and made no reference to the level/amount of underconsumption that will result in the net benefit forgone.*
- *A number of students did not mention how the Q_e and Q_s are determined/derived – they must state the condition that free market equilibrium occurs at MPB = MPC while, socially efficient level of consumption occurs at MSB = MSC.*
- *A large number of students also did not provide the reason for the decisions made by individuals at the free-market equilibrium based on self-interest of consumers and producers. The same applies to the market for which imperfect information exists – why consumers are unaware of the real private benefits.*

Part (b)

Introduction

- The indirect subsidy or the housing loan provided by the government would ideally be able to raise the consumption of improved housing to the socially efficient level.

Body:

R1: Thesis – Explain how the indirect subsidy to housing developers will be effective in raising the free market level of consumption to the socially optimal level.

- Indirect subsidy will reduce the unit cost of production of each improved housing unit by the amount subsidy BD equivalent to the monetary value of marginal external benefit. The developers could potentially use the subsidy to purchase building materials and pay the construction workers.
- This will lead to the rise in the supply of improved housing units (or a decrease in the MPC as reflected by a rightward shift of marginal private cost of production from MPC to MPC – indirect subsidy). There will be a surplus at the initial price of improved housing at P_0 that will lead to a downward pressure on the prices.
- As housing developers aims to clear the vacant units by lowering prices to USD 3000 as intended by the government using the indirect subsidy, it will lead to an increase in quantity of housing units demanded in Dharavi as reflected by a movement along MPB and decrease in the quantity supplied of housing units.
  Hence, the process will continue until the consumption of improved housing increases from Q_e to Q_s by the slum dwellers at P_1Q_s, eliminating the deadweight loss of area ABC.

Thus, the lower price of USD 3000 for an improved housing unit will incentivize slum dwellers in the Dharavi who are mainly low-income earners to relocate to the improved housing from their substandard homes since it is more affordable.

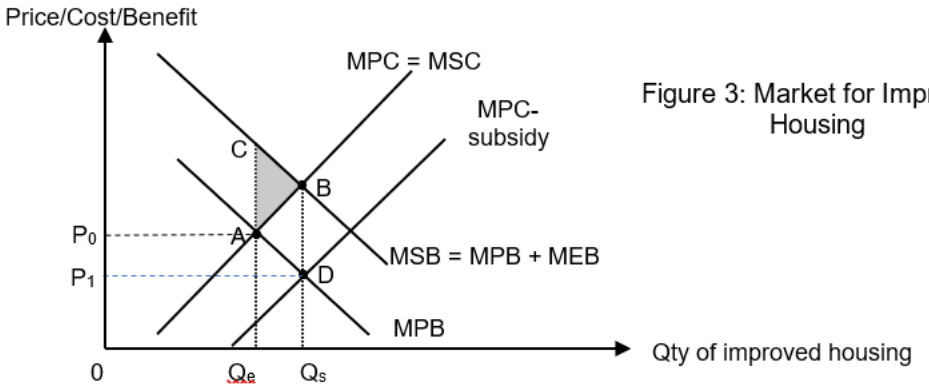


Figure 3: Market for Improved Housing

R1: Anti-thesis – Explain the limitations of indirect subsidy to private developers in addressing the underconsumption of improved housing.

Effectiveness:

- It does not target the root cause of the underconsumption – imperfect information about the real benefits of improved housing – as slum dwellers will continue to remain unaware of the true benefits of relocating to improved housing as they have spent their entire life living in the Dharavi community (mostly from the scheduled caste and migrant communities) and will continue to underestimate the long-term private benefits unless the government steps in to educate them regarding these benefits. The government has faced challenges in convincing the residents to relocate. Hence, many may continue to be hesitant to purchase the improved housing even though it is cheaper at USD 3000.
- Furthermore, even at a relatively lower price of USD 3000 after the indirect subsidy, many of the slum dwellers may still find the improved housing expensive given their low income, particularly those who work as construction workers or as a 'dhobi' in the area. This will limit the extent of increase in consumption of improved housing.
- It relies on the accurate and complete estimation of the MEB from consumption, and subsequent provision of the per unit indirect subsidy = MEB.
    - MEB from a single slum relocation is difficult to single out for measure because
        - reduced crime rates due to better safety and security in improved housing and lowered frequency of contagious diseases does not merely stem from relocation of Dharavi.
        - There could be many other reasons for such better outcomes such as better overall governance in Mumbai, and public health policies.
        - Hence, inaccurate estimation – underestimation of MEB – may result in persistence of the deadweight loss arising from the underconsumption, albeit to a smaller extent.

Desirability:

- In order to relocate a population of over one million from the Dharavi slums to improved housing, the government needs to allocate large amount of funding to the developers given extensive nature of the improved housing units.
    - This will result in high opportunity costs as the Maharashtrian government needs to divert large amount of resources from other sectors of the economy that are in urgent need of funds – such as the Mumbai Police Force given the rising crime rates and the underdeveloped public transport network/infrastructure.
    - Hence, such a measure to increase the consumption level of improved housing to the socially efficient level could be undesirable.

R2: Thesis – Explain why the provision of a housing loan to slum dwellers could ideally be able to raise the consumption of improved housing to the socially efficient level.

- Such a housing loan provided to the slum dwellers at a very low interest rate by the government could increase the ability and willingness of these low-income slum dwellers to purchase improved housing since the initial downpayment/upfront cash outlay for them would be significantly lower, raising the effective demand from MPB to MSB.
- Provision of such housing loans make it easier for slum dwellers to overcome the financial constraints/considerations they may have when deciding whether to purchase a unit of improved housing given that they do not have the collateral to borrow from commercial banks/financial institutions at a relatively higher interest rates to fund the purchase.
- Furthermore, the slum dwellers may be given longer repayment period, for example 10-20 years, reducing their financial burden from paying for the improved housing at one shot.

- This will increase the consumption of improved housing from Q_e to Q_s, eliminating the deadweight loss of ABC arising from the underconsumption.

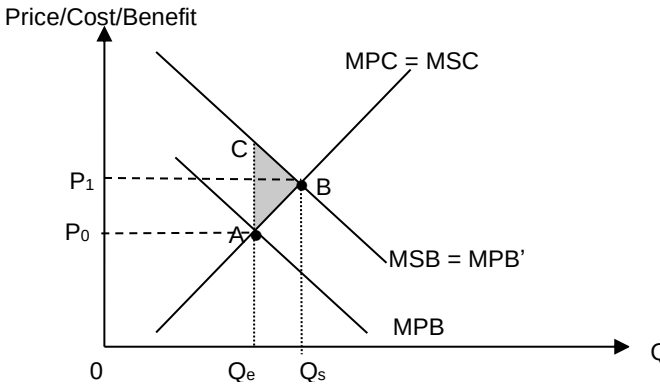


Figure 4: Market for Improved Housing

R2: Anti-thesis – Explain the limitations of provision of housing loans to slum dwellers in addressing the underconsumption of improved housing.

Effectiveness:

- If the loan amount is small and/or the interest payment is prohibitively high, it could deter the slum dwellers from taking on the loan even if the downpayment is relatively lower than before to purchase the improved housing, limiting the effectiveness of this measure as the MPB may increase only marginally and be insufficient in raising the consumption to the socially efficient level.
- Furthermore, given that these slum dwellers are poorly educated and lack the necessary/relevant financial literacy about housing loans, they may be hesitant to take up the loans to purchase the housing in the fear that they are unable to pay back in the future. As a result, the low take-up rate will reduce the extent of increase in the MPB and hence ability of the policy to address the underconsumption.

Desirability:

- The housing loan and its interest payment could become a source of financial burden for the families as their monthly income is generally low, increasing the opportunity cost the household as they have to forgo their daily necessities to meet the monthly repayment.
- Failure in consecutive monthly repayments could result in future eviction from their homes if they are unable to eventually pay up for such a loan in principal and interest.
- Moreover, to repay the loan, the slum dwellers may need to take on more jobs and work longer hours, negatively affecting their quality of life.
- Hence, overall, the provision of housing loans to the slum dwellers could result in undesirable outcomes.

Feasibility:

- Such a policy is also not easy to implement and administer given the sheer number of slum dwellers in the Dharavi slum and the time taken to oversee the measure.
    - Administratively, the time taken to process these loans (conduct risk assessment of the slum dwellers) and disburse them appropriately is lengthy as it takes time to determine if the families qualifies for the loan.
    - The government will also not have sufficient information to check if the household is able to pay back the loans due to lack of information on their income.

- Recovery of these loans will also be difficult to oversee, and the government may need to hire more manpower to recover these loans over the entire repayment period.

Conclusion and Evaluation

- In order to decide whether the indirect subsidy to developers or the provision of housing loans is better, the students need to use a set of conditions/yardsticks to make the comparison:
  - The indirect subsidy makes improved housing cheaper, increasing quantity demanded, while the housing loan raises demand for such units such that consumption occurs at the socially efficient level. However, the indirect subsidy would be the better policy, because it is more effective and the outcome more desirable as well as feasible compared to the provision of housing loans to slum dwellers to address the underconsumption of improved housing.
  - *Effectiveness as a yardstick of comparison between the policies:*
    - The indirect subsidy is more effective since it reduces the price of the improved housing unit to USD 3000 which is more affordable compared to the provision of housing loans as it will increase the overall price of the housing unit even though the downpayment will be lower and rest paid with a loan.
    - The lower price will therefore have a stronger influence on the decision of the slum dwellers in relocating since it is cheaper, and they do not have to worry about paying a higher price for the same unit that comes with significantly additional financial burden for these low-income earners.
    - Furthermore, a housing loan does not guarantee that there will be access to improved housing units to the slum dwellers as it only serves to increase the purchasing power and does not provide sufficient incentives to housing developers to provide improved housing units since they are motivated by profits and will find undertaking such projects as less profitable. Meanwhile, provision of indirect subsidy will ensure that improved housing units are built by the developers as contracted by the government and the slum dwellers can therefore purchase it at a lower price.
  - *Feasibility as a yardstick of comparison between the policies:*
    - Providing an indirect subsidy is also administratively easier to implement and less costly for the government since it requires them to offer the contract to the developer that is most suitable for the project out of the numerous bids they will receive. They will also be able to conduct their risk assessment of these housing developers more easily compared to provision of housing loans to over a million of households in the slum. It will take a significantly longer time and given the imperfect information; the government will find it more difficult to conduct financial check on the slum dwellers to check if they qualify since it is not possible to verify their employment status as well as their ability to pay back due to the lack of a reliable source of income for many of them.
    - Moreover, providing an indirect subsidy to a housing developer is an one-off contractual arrangement, while provision of loans requires the government to follow up on the loan repayment of millions of slum dwellers over a period of 10 years at least, making it less feasible.
  - *Desirability as a yardstick of comparison between the two policies:*
    - The government requires more financial resources to fund the provision of the loans to the slum dwellers (over a million residents) compared to providing a one-off indirect subsidy to housing developers.
    - Though the housing loans comes with a repayment of the full amount along with the interest payment, there is no guarantee that it will be paid back in full as many of these slum dwellers are daily wage earners with very limited income. Hence, many may not be able to pay back the full amount.

- Moreover, hiring people to recover the loans will be costly which the government need not incur when providing an indirect subsidy. Thus, reducing the degree of opportunity cost arising from the provision of indirect subsidy.
- Furthermore, indirect subsidy lowers the price of the improved housing unit, increasing affordability and hence equity since more of the slum dwellers can enjoy the improved housing. In contrast, consumer loans make housing units become more expensive as demand rises.
- The housing loan also involves intergenerational inequity and also inequity in distribution of the loan compared to indirect subsidy. Care needs to be given to advice slum dwellers of the future financial implications of taking up a housing loan, as it could lead to greater financial burden on their children to repay the loan in future. The distribution of the loan also needs to be fair for each household, according to their income levels and ability to purchase improved housing. In contrast, the indirect subsidy will lower the price for everyone, and the same price needs to be paid regardless of the resident.

Mark Scheme:

Level	***Knowledge, Application/Understanding and Analysis***	
L1	• *Vague or inaccurate knowledge of how indirect subsidy (R1) and provision of loans to consumers (R2) work* • *No use of relevant economic framework or analysis applied* • *Unexplained listing of points* • *Critical errors in analyses of intervention* • *Descriptive explanation of answers* • *No application to the context using relevant examples – a purely theoretical response*	*1 – 4*
L2	• *Some economic analysis of the indirect subsidy and provision of housing loans using a relevant economics framework* • *Some contextual examples provided* • *Some gaps or lapses in analyses of interventions.* • *Some discussion of effectiveness and other yardstick of R1 and R2 measures*	*5 – 7*
L3	▪ *Good scope of coverage of interventions* ▪ *Detailed analysis and discussion of the respective R1 and R2 measures based on effectiveness and any other yardsticks such as desirability and feasibility* ▪ *Good use of context applied throughout*	*8 – 10*
	Evaluation	
E1	▪ *Unsupported judgment about the better government measure* ▪ *Superficial conclusion/ assertion*	*1-2*
E2	▪ *Substantiated judgment, recommendation supported by reasons/ economic analysis*	*3-4*
E3	▪ *Insightful and perceptive evaluation and recommendation well discussed and evaluated using economic analysis and good application to the context* ▪ *2 well explained insights*	*5*

Examiners' Comments:

- *Majority of the students were able to provide a balance answer on how indirect subsidy addresses the underconsumption of improved housing using relevant economics framework and a diagram as well as limitations. Nonetheless, students are reminded to explain a brief analysis of the market/price adjustment process when explaining how market-based policies such as the indirect subsidy works.*
- *However, a vast majority of the students did not demonstrate understanding of housing loans and the condition of a repayment that comes with it. They confused housing loans with a direct subsidy and went on to state that it would be equivalent to the amount of the MEB. The loan is based on the price of the improved housing unit and the financial credibility of the borrower to pay back. Furthermore, the loan does not reduce the overall price of the housing unit. In fact, with a higher MPB, the price of the improved housing unit will increase due to the shortage at the original price level.*
- *A handful of students also misunderstood the provision of housing loans as a direct provision of the improved housing units by the government. Students need to be aware that the housing loans is a means to increase affordability of the slum dwellers and have no impact on the availability of the housing units to them.*
- *Students are encouraged to elaborate one or two limitations at most using relevant examples – should go beyond mostly listing multiple limitations that does not add value to their analysis.*
- *Though majority of the students drew diagrams to illustrate how the policies work, they were not labelled. There was no reference to the lower price in the diagram as an outcome of the indirect subsidy to the housing developers. Furthermore, many labeled the MPC post indirect subsidy incorrectly as MPC+indirect subsidy instead of MPC-indirect subsidy.*
- *Students need to redraw the complete diagrams in part b with illustration of the policies along with the source of market failure. Students should not refer to their diagrams in part a to respond to a question for part b.*
- *Some responses were purely theoretical, with no reference to the context of improved housing in India.*
- *A number of students did score well for evaluation as they did not manage to compare the policies based on certain conditions/yardsticks to decide which is the better policy and merely rehashed their limitations independently. Students who provided comparative insights between effectiveness of these policies, and used other criteria for evaluation, tend to score better. Students are encouraged to provide an overall summative statement at the end after comparing the policies based on the yardsticks.*

********END********

"You never fail until you stop trying" ~ Albert Einstein