2018 JC2 H2 Econs Prelim Paper 2

Section A

2018 JC2 H2 Econs Prelim Paper 2 Question 1

1	Analysts are forecasting a sharp rise in oil prices by the end of this year as a result of a reduction in oil flows in Iraq due to fighting between government forces and Kurdish militant groups. In addition, oil production is still being withheld as part of a pact between the Organization of the Petroleum Exporting Countries (OPEC) and non-OPEC producers to tighten the market. In the main growth areas of Asia, consumption remains strong especially in China and India, the world's top importers. Adapted from https://www.reuters.com/article/oil-prices, 23rd Oct		
	(a)	Explain how the above-mentioned factors might have caused a sharp rise in oil prices.	[10]
	(b)	Discuss whether a subsidy or a maximum price control is more effective in increasing the affordability for petrol due to the rise in oil prices.	[15]

(a)

Question Analysis	
Command	Explain
Content	Demand, Supply, Elasticities
Context	Oil Market
Synopsis: *Students are required to identify the 1 demand and 2 supply factors from the preamble that caused the increase in oil prices. After which, they have to use PED and PES concepts to account for the sharp (magnitude) increase in prices.*	

Intro:

- State what determines price in a free market. (demand and supply)
- The reason for the 'sharp' rise in oil prices can be attributed to:
    - Rise in Demand "…consumption remains strong especially in China and India…"
    - Fall in Supply "…fighting between government forces and Kurdish militant groups…" together with "…a pact between the Organization of the Petroleum Exporting Countries (OPEC) and non-OPEC producers…"

  Coupled with:

    - The PED and PES of oil being price inelastic.

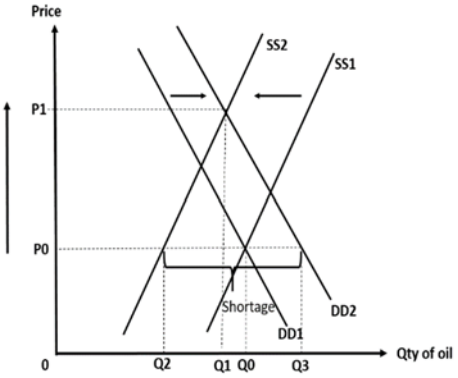
Body 1:

- Demand for oil rose due to rapid growth of emerging economies, China and India. Oil is required as a factor input for production processes. Thus, due to industrialisation in China and India, the demand for oil rose.
- Supply falling due to reduction in flows in Iraq due to fighting between government forces and Kurdish militant groups. As there was political and social instability in Iraq, the supply of oil was disrupted. (Iraq holds 12.1% of OPEC crude oil reserves).
- Supply of oil production being withheld as part of a pact between the Organization of the Petroleum Exporting Countries (OPEC) and non-OPEC producers to tighten the market so as to reduce the glut due to the boom of US shale oil output. This will help to maintain the price of oil so that oil producers will not suffer from low oil prices if supply continues to rise.

Body 2:

- Demand of oil is price inelastic as it is a form of necessity for production processes.
- Supply of oil is also price inelastic as the construction time of oil rig is likely to be long. Changes in quantity supplied is also likely to be less responsive to price changes as oil production is being withheld as part of a pact between the Organization of the Petroleum Exporting Countries (OPEC) and non-OPEC producers to tighten the market.

Body 3:



- As shown in the diagram above, the increase in demand for oil will cause the demand curve to shift rightwards from DD1 to DD2 and the fall in supply for oil will cause the supply curve to shift leftwards from SS1 to SS2.
- A shortage of Q2Q3 now exists at the original price, P0. During a shortage, consumers will bid for higher prices to get the limited amount of oil. And as price rises, quantity supplied will also increase according to law of supply. Thus, shortage will drive up prices and price of oil will now increase from P0 to P1. The magnitude of the increase in price will also be larger as demand and supply are price inelastic. At P1, the quantity demanded is the same as quantity supplied and hence, the market is in equilibrium.

Conclusion:

- Sharp rise in oil prices will raise the cost of production in the country and this will have negative consequences on the macroeconomic goals.
- Hence, governments will have to implement policies such as subsidy and maximum price controls to curb the negative effects of rising oil prices.

Qn 1 part a)
Mark Scheme:

Knowledge, Application, Understanding and Analysis		
L3	• Question requirements are interpreted accurately. • Appropriate economic concepts (Demand, Supply and Price Elasticities of Demand and Supply) are used. • Well-developed explanation of how the factors mentioned in the preamble caused a sharp rise in oil prices. • Appropriate Demand/Supply diagram/s is/are used to support economic analysis. **Makes reference to the context.** - SS change in drastic (Military conflict together with the Pact amongst both OPEC and non-OPEC) - DD change is small ("remains strong", rather than 'increased growth') - DD inelastic (provides anecdotal support) - SS inelastic (provides anecdotal support)	8 – 10
L2	• Addresses some question requirements accurately. • Some appropriate economic concepts (Demand, Supply and Price Elasticities of Demand and Supply). • Undeveloped explanation of how the factors mentioned in the preamble caused a sharp rise in oil prices. • Appropriate Demand/Supply diagram/s is/are used but might not be explained or used to support economic analysis. **Competent use of economic theory and tools of analysis (to account for the sharp rise in prices)** - Shows double shifts - Relates to PES and PES - Single shift with no reference to elasticity concepts.	5 – 7
L1	• Question requirements are interpreted inaccurately.	1 – 4

	• Inappropriate economic concepts, theories and principles are used. Inaccurate economic analysis. • Inappropriate or wrong diagrams are used. **Weak/no use of economic tools of analysis** - Single sided shift. - Confused btwn dd & ss concepts - Incorrect analysis	

(b) Discuss whether a subsidy or a maximum price control is more effective in increasing the affordability of petrol due to the rise in oil prices.

Question Analysis	
Command	Discuss whether
Content	Workings of subsidy and maximum price control
Context	Oil prices rising, no particular country required (students will need to bring in relevant examples to explain the answer)
Synopsis: *Students need to recognise that oil is a factor input for producing petrol. Hence, the price of petrol will rise due to rising oil prices. Students will then be required to explain how a subsidy and maximum price control work to increase the affordability of petrol and analyse which method is more effective.*	

Intro:

- State the importance of keeping petrol affordable :

Petrol is used to power private transport and is important to maintain mobility of labour and commerce in the economy. Efficient low cost transport is important for the running of a market economy.

- Outline the criterion to assess 'effectiveness':

We will examine two approaches available for governments to keep petrol affordable; subsidies and maximum price controls. The effectiveness of these measures will be assessed against the ability to reduce price, the costs of implementation as well as the potential side-effects.

Body 1: How a subsidy works:

- **Subsidy** → reduce cost of production → SS increase from SS1 to SS2 as shown in the figure below → Price will fall from P_1 to P_2 and Quantity will rise from Q_1 to Q_2

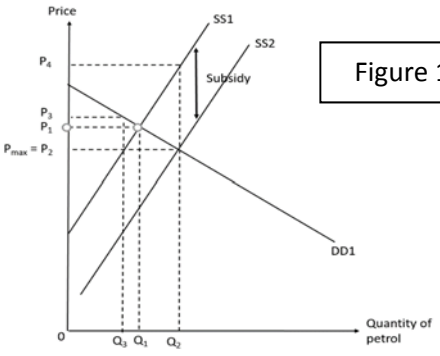


Figure 1

Body 2: Effectiveness of subsidy

- <u>PRICE:</u> Subsidy → P falls from P_1 to P_2 and Qty will rise from Q_1 to Q_2. Therefore, consumers can consume more petrol than before at a lower price (affordable for consumers).
- <u>IMPLEMENTATION</u>: Subsidising the producer is fairly easy to do by directly funding producers/suppliers of oil producers/retailers.
- <u>SIDE-EFFECTS</u>: Government also has to have sufficient funds to subsidise the consumers. If the government does not have sufficient budget to do so, it will have to either borrow or raise taxes such as personal income tax and/or corporate tax so as to raise revenue to fund the subsidies.
- <u>OTHER CONCERNS:</u>

- Govts cannot be assured that the funds given to reduce the producers' costs of production will result in lower prices. Funds could just be kept as increased profits by producers not reducing prices.
- Unintended consequences: A subsidising and lowering the price of oil/petrol will have the effect of reducing the incentive for consumers to use 'greener' sources of energy. This fall in demand for alternative fuels will eventually result in a less than desirable level of pollution in the country.
- NOTE: The effectiveness of the subsidy also depends on the type of subsidy provided. A subsidy on oil would have a more far reaching effect than a subsidy on petrol. Subsidising petrol would directly benefit the end user of petrol. A subsidy on oil would not only benefit the end user of petrol but would have a more far reaching effect on the general cost of production as oil is used in the generation of electricity, which in turn affects the cost of production of almost all goods an services.

Body 3: How a price ceiling works

- **Maximum Price Control** → Price ceiling → a *legally established maximum price* → It is binding when it is set below the market equilibrium price→ With reference to the figure below, it is at P_{max} which is below original price, P_1.

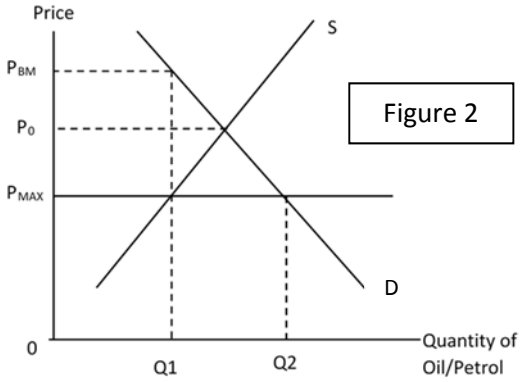


Figure 2

Body 4: Effectiveness of Price ceilings

- PRICE: If P_{MAX} is set below the equilibrium price then the price consumers pay will be lower (more affordable). However, the quantity supplied to consumers will only be at Q_1 even though quantity demanded at this lower price is at Q_2. This means there will be a shortage of Q_2Q_3.
- IMPLEMENTATION: A price control is also easy to set but policing costs may be high as the resultant shortage will encourage the formation of black markets selling at a higher price (P_{BM}). To be effective these black markets would have to be policed and brought under control.
- SIDE EFFECT: The primary side-effect of any form of price control would be the formation of black markets. In this case the official/legal retailers who sell at the low price of P_{MAX} would not be able to supply all the consumers (because of the shortage). Thus, consumers who are willing and able to pay a higher price, in this case P_{BM} will entice retailers to sell them at this much higher, illegal price.
- OTHER CONCERNS:
  - The resultant shortage can lead to many other potential problems other than black markets. This could include looting, and other socially disruptive behaviour among consumers.

Body 5: Comparison and assessment:

- AFFORDABILITY/PRICE:
  - In terms of affordability, although both measures are able to reduce price, a subsidy ensures greater levels of consumption while a price ceiling will actually reduce levels of consumption. Subsidising production means increased output (Q1 to Q2 in Fig1), however, a price ceiling reducing the quantity consumed to Q1 (Fig 2).
  - In terms of each measure's ability to reduce price, they are both equally effective. Since the demand of petrol tends to be inelastic a relatively small subsidy can result in a significant fall in the price. In the case of a price ceiling, the maximum price set could be set arbitrarily, independent of demand and supply conditions.
- IMPLEMENTATION: A rich government with ample budget reserves can afford to subsidise oil/petrol producers (even if the oil/petrol market is a major market in the economy). However, a government facing budget problems or with a large national debt, may be reluctant to use subsidies. On the other hand, the implementation problems associated with a price ceiling are connected with policing costs. Thus, governments with strong policing abilities like military dictatorships may implement price controls with little difficulties.

Conclusion:
Overall, subsidy seems more effective than a maximum price control as the latter creates a black market which creates more inefficiency and may eventually raise the price even higher than the original price. If maximum price control is used, macroeconomic goals (economic growth & stable prices) may be compromised due to producers facing rising cost of production (due to high prices charged in black market) and cutting back on production (due to shortage of petrol).

Nevertheless, it also depends on the country's financial capabilities as well. A government in budget deficit is unable to provide subsidies and may incur debt and worsen economic situation if it borrows. Also, provision of subsidies is not a long-term solution as it is a strain on government's budget and incurs opportunity cost. Thus, subsidies may be provided in the short-run but government has to implement other policies such as reducing the reliance on petrol by using biofuels.

Part b) Mark Scheme:

Knowledge, Understanding, Application and Analysis		
L3	• Well-developed explanation of how subsidy and maximum price control work to increase affordability of petrol. • Detailed analysis on the effectiveness of subsidy and a maximum price control in increasing the affordability of petrol. • Appropriate diagrams are used to support economic analysis, where relevant. Good use of contextual examples to illustrate points. Responses that were able to distinguish between the markets for "oil" and "petrol" should get to this level.	8 – 10
L2	• Undeveloped explanation of how subsidy and maximum price control work to increase affordability of petrol • Limited analysis on the effectiveness of subsidy and a maximum price control in increasing the affordability of petrol. • Appropriate diagrams are used but might not be explained or used to support economic analysis. Largely theoretical answer with little or no illustrative examples. Economic analysis is incomplete and/or contains some errors.	5 – 7
L1	• Question requirements are interpreted inaccurately. • Inappropriate economic concepts, theories and principles are used. Inaccurate economic analysis. • Inappropriate or wrong diagrams are used.	1 – 4
Evaluation		
E3	Evaluative comments on whether a subsidy or a maximum price control is more effective in increasing the affordability of petrol.	4 – 5
E2	Attempt to explain evaluative comments is incomplete or inaccurate at times.	2 – 3
E1	Evaluative comments are unexplained or not supported by economic analysis.	1

2		The merger of the UK's second- and third-largest supermarket chains (Asda-Sainsbury) could hand them control of about 30% of the grocery sales, a similar level to Tesco, meaning two businesses would account for 60% of the market in future. Adapted from The Guardian, 3rd May 2018	
		Discuss whether the UK government should be concerned with the merger of these supermarket chains.	[25]

Question Analysis	
Command	Discuss whether
Content	Effects of merger on the social welfare
Context	**These** Supermarket Chains (i.e. Asda and Sainsbury)
Synopsis: *Students are required to explain how the merger of Asda and Sainsbury will increase their market share and its impacts (both negative & positive) on the society (i.e. consumers and producers as a whole). Thereafter, students will need to weigh the positive and negative impacts (costs & benefits) and come to a judgment on whether the UK government should be concerned with the merger of these supermarket chains with substantiation.*	

Intro:
A merger refers to when two firms agree to go forward as a single firm rather than to remain separately owned and operated. In this case, firms may decide to merge to pursue cost savings and/or increased market share, with the underlying motive of increasing profits. The merger could bring about both negative and positive impacts on the society (i.e. *consumers and producers as a whole)*. Thus, it is important that UK's government analyses these impacts to determine whether they should be concerned with the merger in their desire to pursue **efficiency** and **equity** which in turn maximises social welfare.

Body 1: Why would the firms merge?

Merger between Asda & Sainsbury will bring about costs savings

- The increased scale of production from merger lead to greater scope for reaping internal EOS ***[Illustrate using an example of internal EOS due to merger]*** which refers to a fall in AC arising from increased scale of production of a firm and thus increases profits, ceteris paribus.

Merger can lead to higher total revenue earned by Asda & Sainsbury

- By merging, Asda-Sainsbury is able to capture a larger share of the global market as the consumer base from both firms are now combined, which leads to higher demand for Asda-Sainsbury. Demand for the Asda-Sainsbury's products also becomes more price inelastic as consumers now have fewer substitutes to switch to in the same price range. With reference to Figure 1, firm's demand increases from AR to AR', Asda-Sainsbury will adjust its output to where MR'=MC. Equilibrium price and quantity sold increases to P' and q' respectively, leading to higher TR which is price multiplied by quantity sold. Profits therefore increase from area PBEAC to area P'FGAC' as seen in Figure 1.

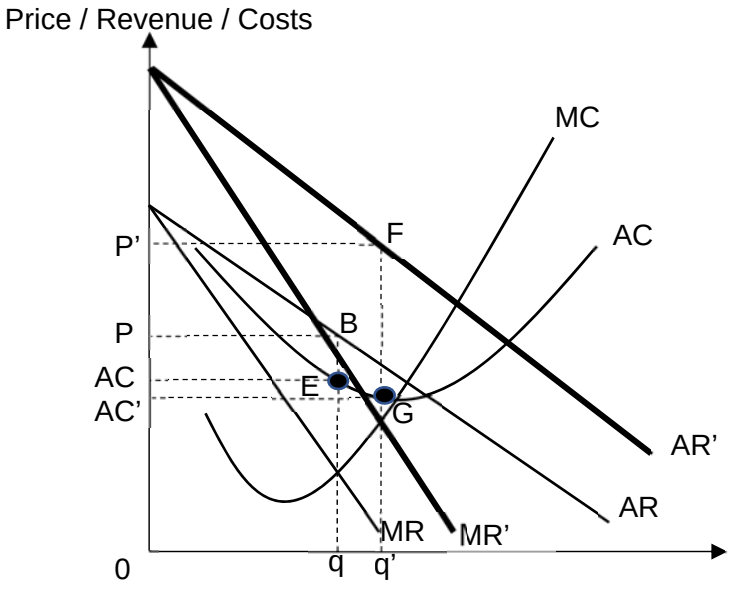


Figure 1

Body 2: Government should be concerned with the merger of the supermarkets

With less competition in the market, it may result in worsening of allocative efficiency

- The merger of Asda-Sainsbury could be intended to deter entry of potential entrants by Asda or Sainsbury given that they control about 30% market share as indicated in the preamble. In this instance, this would be considered as an example of artificial barriers to entry which could lead to possible market dominance. As a result, it would face a higher demand as Asda-Sainsbury captures a larger section of market demand. Asda-Sainsbury would also have a more price inelastic demand as there are now fewer firms in the market after the merger, which means there are fewer substitutes available in the same price range. Assuming cost conditions remains unchanged with merger, this would result in greater social welfare loss. Before the merger, the deadweight loss is represented by area abc as shown in Figure 2. There was underproduction since for the units between the profit maximising output level (Q) and the allocative efficient level (where firm's AR cuts MC), P>MC, society values each of the units more than the MC of producing it which yields a net gain for society. By not producing those units, society lost the potential gain in welfare. After the merger, the deadweight loss is represented by area def, which is bigger than area abc.

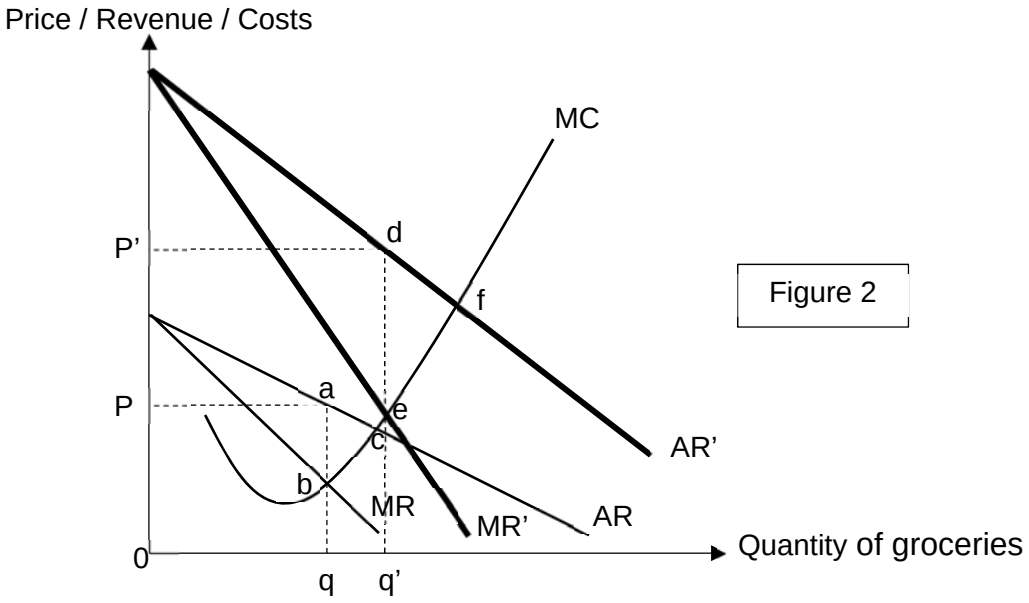


Figure 2

With the merger, there may be greater inequity

- Due to the possible market dominance of Asda and Sainsbury, consumers are now charged at a higher price of P' as explained above. Given that groceries are necessities, the demand for groceries would likely to be price inelastic especially for the low income consumers. An increase in price of groceries would result in a less than proportionate decrease in quantity demanded of groceries and thus there would be an increase in consumer expenditure on groceries for the low income consumers. In addition, Asda-Sainsbury would enjoy an increase in supernormal profits from area PBEAC to area PFGAC as seen in Figure 1. This worsens inequity between consumers and firms as Asda-Sainsbury gains its profits excessively at the expense of low income consumers who require groceries for survival.
- It may also lead to worsening of inequity as structural unemployment may result. With merger, there would be streamlining of processes such that redundant workers are laid off. For example, instead of Asda and Sainsbury having 1 marketing manager each, Asda-Sainsbury now only needs only 1 marketing manager. Hence, the workers that lose their jobs may find themselves structurally unemployed since the skills the retrenched worker possess may not match with what the UK economy needs, thus worsening equity in income distribution between households.

Merger may lead to X-inefficiency

- The merger may lead to the pursuit of alternative objective such as revenue maximisation given that the shareholders of Asda-Sainsbury (who are primarily interested in maximising profits) could be more far removed from the operations of the firms to be fully aware of the optimal decisions that need to be made to maximise profits.
- This may lead to complacency of Asda-Sainsbury's managers where the income of these managers could be dependent on the total revenue of the firm. Thus, they may not do its best to produce at the least average cost given its supernormal profits earned from merger as seen in Figure 1. As a result, they might choose to maximise total revenue rather than profits which would result in X-inefficiency. ***[Explain and Illustrate using a graph]***

Merger may lead to less process and/or product innovation

- If the market of supermarkets is less contestable, the possible market dominance due to merger could lead to less incentive for R&D and thus less process and/or product innovation ***[Provide examples to illustrate]*** → no improvement in quality over time, limited increase in variety over time, limited reduction in average cost over time.

Body 3: Government should not be concerned with the merger of the supermarkets

With a merger, prices can be lowered which can improve equity.

- The merger of Asda-Sainsbury could result in the increased scale of production which enables it to use a bigger plant, resulting in internal EOS. For example, it can enjoy technical EOS from a bigger warehouse due to the principle of increased dimensions – storage space rises more than in proportion to construction costs.
- As a result, Asda-Sainsbury may lower its price ***[Explain & Illustrate using a graph]*** which makes groceries more affordable for low income consumers. Given that groceries are necessities, the demand for groceries would likely to be price inelastic for the low income consumers. A decrease in price of groceries would result in a less than proportionate increase in quantity demanded of groceries and thus there would be a decrease in consumer expenditure on groceries for the low income consumers. This would improve equity in distribution of goods as the low income consumers are better able to access groceries given that these are essential goods for survival.

The merged supermarket may be more dynamically efficient.

- R&D tends to be costly and inherently risky with uncertain results. With increased profits earned from the merger, Asda-Sainsbury would have greater ability to undertake investments in R&D. This results in process and/or product innovation, which enhances dynamic efficiency and improves society's welfare over time.
- Through process innovation, cost may be reduced and this will result in both AC and MC falling ***[Explain and Illustrate using examples]***, leading to a lower price charged by the firm and larger output produced. As shown in Figure 3, this is beneficial for society's welfare as consumers benefit from lower prices (P to P') and higher consumer surplus, and firms also benefit from increased profits earned from area PBDAC to area P'EFAC'.

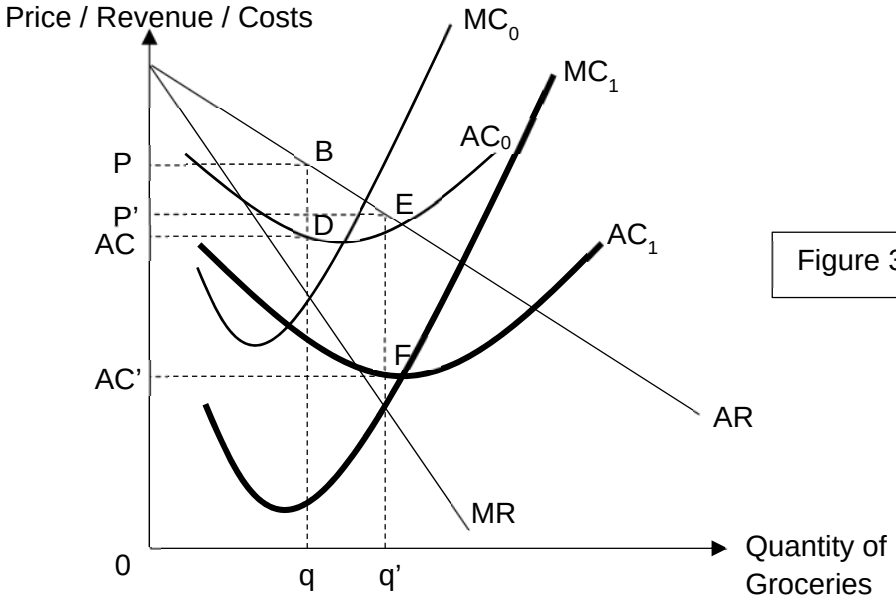


Figure 3

The merged supermarket is better able to compete with foreign supermarkets and also venture overseas.

- With internal EOS reaped and product, process innovation undertaken, Asda-Sainsbury would thus be able to lower its prices as highlighted above and/or offer higher quality products for consumers in future and better able to compete with foreign supermarkets such as Aldi and Lidl. They may also eventually be able to expand their supermarkets overseas and thus increase total revenue and thus profits, ceteris paribus. ***[Explain & Illustrate using graph]***

Conclusion:

- Overall, the UK government should not be concerned in the short run given that the supermarket is largely contestable given that the potential entrants such as Amazon has access to technology to deliver the groceries items sold in the physical store in the supermarket chains. Moreover, supermarket sells necessities to consumers where the merger may result in lower prices for Asda-Sainsbury products given the constraint of prevailing price wars among discount supermarket chains such as Aldi in the recent year which would be significantly beneficial for the low-income households and thus achieving equity. These constraints would likely to result in merged Asda-Sainsbury to bring greater benefits arising from reduction in cost to the society than the costs of higher market share.

- However, the scope for internal EOS that can be reaped from the merger is likely to be lower for supermarkets given that the production process is still rather labour-intensive. Furthermore, Asda – Sainsbury would hold 30% of the market which is similar to Tesco, the merger could be intended to deter potential entry in the future through anti-competitive strategies which may result in higher prices in the future and thus worsens equity. Thus, the net benefits arising from merger could be smaller in the long run. Thus, the UK government would need to be concerned in the long run which explains why the competition authorities in UK would investigate mergers if the combined firm have at least a 25% market share[1].

[1] https://www.gov.uk/mergers-when-they-will-be-investigated

Mark Scheme:

Knowledge, Understanding, Application and Analysis		
L3	• Thorough knowledge of merger and theory (cost/revenue concepts & firm's graph) coupled with an excellent ability to use firm's diagram to explain the various impacts (both positive and negative) of the merger on the consumers and producers as a whole which in turn affect both efficiency and equity in a precise, logical and reasoned manner • Excellent use of examples that are appropriate to the context presented in both preamble and the question set. • Good knowledge of merger and theory (cost/revenue concepts & firm's graph) coupled with an ability to use firm's diagram to explain the various impacts (positive and negative) of merger on the consumers and producers as a whole which in turn affect both efficiency and equity. • Good application to question set including the information presented in the preamble. • Good use of examples that are appropriate to the context presented in both preamble and the question set. • Reasoned (analytic) structure to the whole answer.	18 – 20 15 – 17
L2	• Answer relevant to the question but theory (cost/revenue concepts & framework) and the various impacts of merger on the consumers and producers as a whole which in turn affect both efficiency and equity incompletely explained. • Some ability at diagrams with incomplete explanation. • Accurate but undeveloped explanation of the various impacts of merger on the consumers and producers as a whole which in turn affect both efficiency and equity together with undeveloped explanation of the theory (cost/revenue concepts & framework) • Limited ability at organisation of ideas.	12 – 14 9 – 11
L1	• Shows some knowledge of what merger is and why firms merge. • Meaning of question not properly grasped. • Basic errors of theory. • Inadequately explained. • A few valid points. • Answer mostly irrelevant or inaccurate.	5 – 8 1 – 4
Evaluation		
E3	Well-explained judgment on whether UK government should be concerned with the merger of these supermarket chains supported by economic analysis.	4 – 5
E2	Attempt to explain evaluative comments is incomplete or inaccurate at times.	2 – 3
E1	Evaluative comments are unexplained or not supported by economic analysis.	1

3	(a)	Explain how consumers and firms make rational decisions in the pursuit of self-interest.	[10]
	(b)	Discuss whether rational decision-making by consumers, firms and government will always lead to an efficient allocation of resources.	[15]

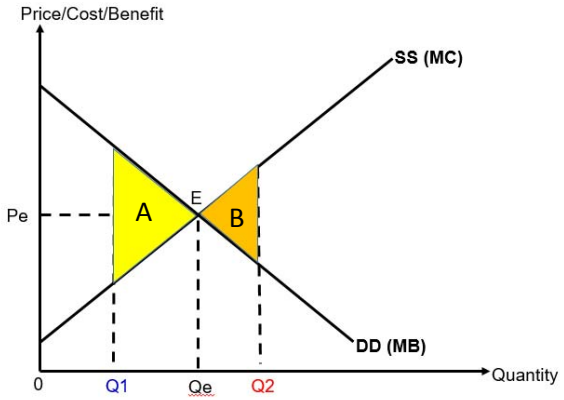
Question Analysis	
Command	Explain
Content	Marginalist Principle
Context	Consumers and Firms
Synopsis: • Students need to show an understanding that consumers and firms makes rational decision where they aim to maximise their self-interest (Consumers: utility maximisation, Firms: profit maximisation). After which, they are required to use the Marginalist Principle to explain how consumers and firms make rational decisions.	

Intro:

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

Body 1: Marginalist principle applied to consumers

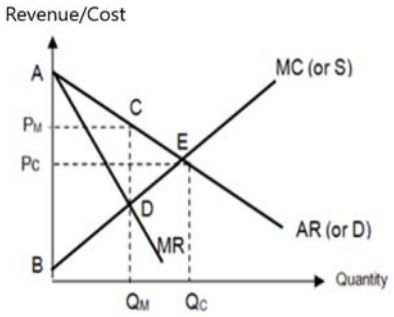
- A rational consumer seeks to maximise net total benefits from consuming a good. Rational decision-making by consumers involves considering the marginal benefits and the marginal costs of consuming the good.
- The marginal benefit is the satisfaction derived from consuming an additional unit of the good while the marginal cost is the price paid for the good.



- At Q1, there is under-allocation of resources to this product from society's viewpoint. There has also been a loss of welfare which is called deadweight loss (area A). Welfare can be increased by increasing consumption up till Qe.
- At Q2, there is over-allocation of resources to this product from society's viewpoint. There has also been a loss of welfare which is called deadweight loss (area B). Welfare can thus be increased by reducing consumption up till Qe.
- Therefore, consumers will consumer till the point at Qe where MB = MC (P) to maximise net total benefit.

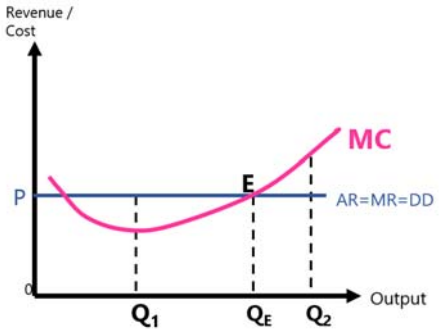
Body 2: Marginalist principle applied to firms

- A rational firm seeks to maximise total profits from the production and sale of a good. Rational decision making by firms means that firms will base their output decision on the marginal revenue and marginal cost.
- In deciding how many units of a good to produce, a profit maximising firm will produce up to the point where the additional cost from producing one additional unit of output equates the additional revenue from selling it.
- A firm with monopoly power can control either the price or output. Being rational in their decision making, monopoly firms will maximize their profits and set a price at P_M at quantity Q_M where MC = MR, referring to Figure 2 below. However, consumers value an additional unit of the good more than its marginal cost and hence welfare can be further increased by increasing the production of the good to where P = MC at a lower price P_C and at a greater quantity Q_C. Thus, there is a deadweight loss of CDE due to the under-production of goods and services by large and dominant firms. Welfare is not maximized and hence market dominance causes an inefficient allocation of resources.



OR

- Assuming it's a perfectly competitive firm.



- A rational firm will produce and sell an extra unit of a good as long as MR > MC (Q1). Because this means that by producing that unit, there will be bigger addition to revenue (MR) than to cost (MC) and total profits will increase given that marginal profit is positive.
- When production by the firm is at an output (Q2) where MC exceeds MR, producing that add more to cost than to revenue and hence reduce profit. Firms' profits can be increased by cutting back on production since marginal profit is negative. Firms thus produce up to the point, Q_E where MR=MC where the total profit is maximised.

Conclusion:

- The marginalist principle is adopted by both consumers and firms when they attempt to maximise their self-interest.
- When resource allocation is left to the price mechanism, goods are produced up to the point where demand matches supply. Since demand reflects MB and supply reflects MC, at the market equilibrium point, where demand matches supply, MB=MC and society's welfare is maximised.

Mark Scheme:

Knowledge, Application, Understanding and Analysis		
L3	• For an answer that uses the marginalist principle to explain how both producers and consumers make their consumption and production decision. • Appropriate diagrams are used to support economic analysis.	8 – 10
L2	• For a descriptive answer that recognises the marginalist principle is the basis of rational decision making but there are gaps in explanation. • Appropriate diagrams are used but might not be explained or used to support economic analysis. • For a one-sided answer that only clearly explains rational decision making by the firms OR consumers. (Max 6)	5 – 7
L1	• Question requirements are interpreted inaccurately. • Inappropriate economic concepts, theories and principles are used. Inaccurate economic analysis. • Inappropriate or wrong diagrams are used.	1 – 4

b) Discuss whether rational decision-making by consumers, firms and government will always lead to an efficient allocation of resources. [15]

Question Analysis	
Command	Discuss
Content	Allocative efficiency and Sources of market failure
Context	Consumers, Firms, Government
Synopsis: • *Students need to explain how rational decision-making by consumers, firms and government will lead to allocative efficiency in a perfect market and analyse 3 sources of market failure in which rational decision-making by consumers, firms and government will lead to allocative inefficiency.*	

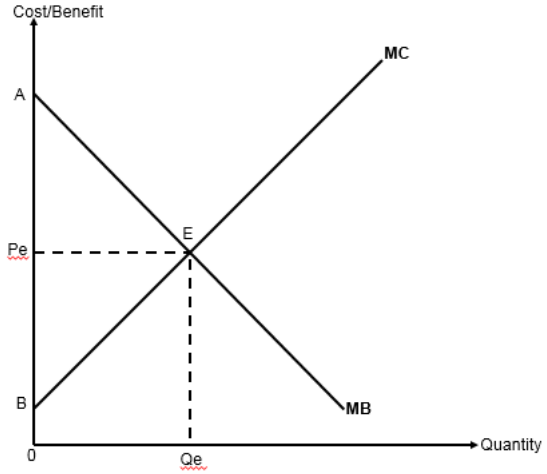
Introduction

- An efficient allocation of resources occurs when there is an optimal distribution of goods and services. With consumers aiming to maximize their satisfaction, firms aiming to maximize their profits and government to ensure efficiency in allocation and equity in wealth and income distribution, rational decision-making by these economic agents could lead to efficient allocation of resources in certain circumstances.

Body 1: Thesis: Rational decision-making by consumers, firms and government always leads to an efficient allocation of resources.

- Rational decision-making by consumers, firms and government will lead to an efficient allocation of resources under the conditions that goods have no externalities, goods are in rivalry and are excludable, there is perfect competition and information, perfect mobility of factors of production and there are income and wealth equality.

- Allocative efficiency is a situation where the optimal mix of goods and services are being produced resulting in maximisation of welfare where both the consumer and producer surpluses are maximized, at areas AEPe and BPeE respectively. This occurs when firms produce at P_e=MB=MC (Figure 3).



Body 2: Anti-Thesis: Rational decision-making by consumers, firms and government does not always lead to an efficient allocation of resources.

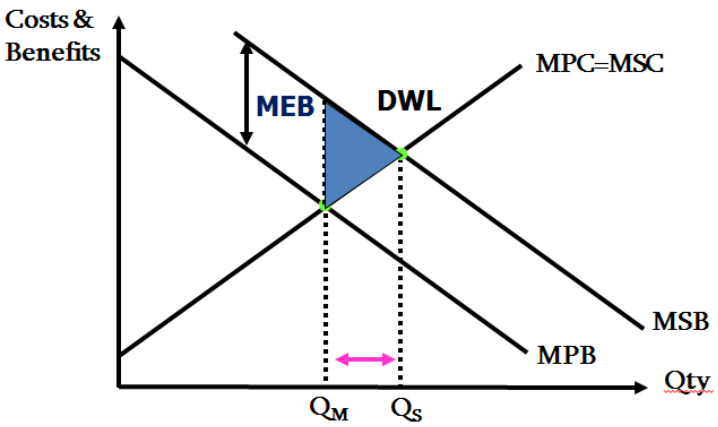
- Therefore, should there be distortions to the market such that the conditions mentioned previously do not hold, rational decision-making by consumers, firms and government will not always lead to an efficient allocation of resources. This means that there are too few or too many resources used in the production of a good or service and the total surplus (consumer surplus + producer surplus) is not maximized. Examples of such situations will be when there are imperfections in the market such as market dominance, goods have externalities and firms and consumers have imperfect information.

- Positive externality or external marginal benefits are benefits borne by individuals or society who are not directly involved in the production or consumption of a good. They are also known as third party benefit. Merit goods such as education, healthcare, sports facilities and museums tend to give rise to positive externalities. Vaccinations against contagious disease not only help the person vaccinated but also the people who he comes into contact with but are not vaccinated (third party) as they have a lesser

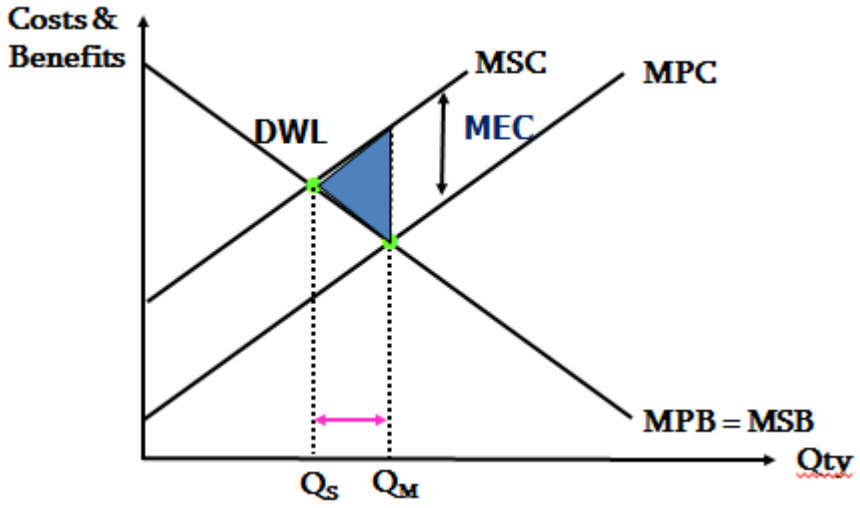
likelihood of contacting the contagious disease (external benefit).

- As there are external benefits to consumers, the MSB curve, lies above the MPB curve by an amount equal to MEB. Without any government intervention, the market equilibrium is where MPC = MPB. This will give the market equilibrium quantity Q_m. The social optimum level of output is attained when the cost of producing the last unit is equal to the benefit derived from the last unit consumed from society's point of view, that is, when MSC = MSB. This occurs at output level Q_s in Figure 6. At Q_m, MSB is greater than MSC. Society values an extra unit of the good more than what it would cost society to produce it. Therefore, the price mechanism under-allocates resources to the production of the good. The shaded area represents the welfare loss to society as a result of this under-allocation of resources. For additional Q_mQ_s units produced, consumers value the product more than what it costs society to produce it. Thus, society's welfare can be increased by increasing output. In general, on its own, the market which functions on self-interest, is incapable of capturing third party costs and benefits in production and consumption decisions, to arrive at a socially optimal level of output which implies that there is inefficient allocation of resources.

- To encourage the consumption of vaccinations, the government can provide subsidies so that the subsidy will internalize the external benefit and the equilibrium level of output will be at the socially optimum point, Qs.



- External costs or negative externality refer to cost borne by individuals or society who are not directly involved in the production or consumption of a good. They are also known as third party costs. In the case where external costs exist, the resultant marginal social cost (MSC) will be greater than marginal private cost (MPC). These occur when individual decision makers fail to consider external costs of their economic activities that are imposed and harmful to third parties. Demerit goods such as cigarettes, alcohol and harmful drugs give rise to negative externalities. Pollution caused by the production of chemicals in the firm and thus dumping of chemical wastes in rivers incurs negative externalities. This affects the fishermen and villagers living near the river (third parties). The fisherman's revenue may be affected due to a smaller catch while the villagers may have to incur higher medical costs from drinking the polluted water (external effect). These external costs are not compensated by the firm which pollutes the river



- As there are negative externalities in production, the MSC curve, lies above the MPC curve by an amount equal to MEC. Without any government intervention, the industry achieves market equilibrium at output Q_m. At this level of output, MPB = MPC. The social optimum level of output is attained when the cost of producing the last unit is equal to the benefit derived from the last unit consumed from society's point of view, that is, when MSC = MSB. This occurs at output level Q_s in Figure 7. At Q_m, there is overproduction of the good compared with the socially optimal level of output, Q_s where MSB curve intersects with the MSC curve. Therefore, the price mechanism over-allocates resources to the production of the good. By summing the excess of the marginal social cost over the marginal social benefit for the additional units Q_sQ_m, there will be a welfare loss to society as shown in the shaded area. Hence, goods which give rise to negative externalities are over-produced resulting in welfare loss. Thus, resource allocation is inefficient and hence negative externalities cause market failure.

- Since external costs result in the overproduction of goods, society can promote an efficient allocation of its resources by adopting policies that encourage the producers of such goods to reduce their output. To reduce the production of chemicals which results in more chemical wastes being disposed in the river, the government can tax the firms responsible for the pollution caused or to issue a tradable permit where a restricted amount of pollution is permitted.

- In a perfectly competitive market, consumers and producers have perfect knowledge of the market and the good or service. However, in the real world, this is not the case and decisions are made based on incomplete information. Often, consumers make decisions to purchase goods based on adequate knowledge of the costs of the product of the seller and the prices of products charged by other sellers. For example, consumers purchase many goods such as cars, fridge, oven and other consumer durables only a few times in a life time. Consumers may not be fully aware of the quality of the goods until they have purchased them. Advertising may contribute to consumers' ignorance and mislead them in terms of the benefits of the good. This imperfect information gives sellers a degree of market power to set a higher price and thus leads to allocative inefficiency. This problem of imperfect information is often seen in the health care markets where patients often do not know enough about medicine to fully comprehend their own health problems and treatment options. Hence, they often rely on the advice of doctors, who are expected to act in the best interests of their patients. Thus, without government intervention, a doctor may prescribe unnecessary tests or recommends more expensive treatments in order to increase his earnings. Thus,

consumer surplus and society's welfare are lower than they would have under a competitive market, leading to allocative inefficiency.

- Although government intervenes to correct the market failure, the government is subjected to government failure as well where on top of trying to solve for market failure, the government may instead create inefficiencies due to insufficient information, administrative costs and political objectives. For instance, as the government intends to subsidize vaccinations so that the external benefit is internalized, the government may not know the full costs and benefits of the subsidize plan. This prevents the government from knowing the optimal level of subsidy to impose to internalize the external benefit. This shows that although the government wishes to address the interests of consumers, they may not be aware of one's wishes and misinterpret behaviours.

Conclusion

- Rational decision-making by consumers, firms and government will lead to an efficient allocation of resources under certain assumptions which often do not hold in reality.
- To improve the situation, government may intervene to move closer to an efficient allocation of resources.
- However, even with good intentions of intervening, government has their limitations too and hence it can also make things worse.
- The government's ability to push forth its policies is also dependent on public acceptance.
- In addition, government intervention to ensure an efficient allocation of resources might introduce further inefficiencies due to high administrative cost, information gaps and time lags resulting from red tape and bureaucracies.
- Hence, the extent of government intervention should be limited to allow the price mechanism to play its role in resource allocation. Provision of goods by the government should be restricted to public goods while other market-based approaches such as taxes and subsidies should be used to tackle market failure arising from other sources.

Mark Scheme:

Knowledge, Understanding, Application and Analysis		
L3	• A well-developed and balanced answer on whether rational decision-making by consumers, firms and government will always lead to an efficient allocation of resources. • Answers shows adequate analysis of the rational decision-making made by the economic agents • Well-developed explanation for 3 cases of how rational decision-making could lead to inefficient allocation of resources, with well-drawn diagrams.	8 – 10
L2	• An undeveloped answer on whether rational decision-making by consumers, firms and government will always lead to an efficient allocation of resources • Applied correct conceptual framework and explained at least 2 cases of how rational decision-making could to inefficient allocation of resources with appropriate examples and diagrams.	5 – 7
L1	• Question requirements are interpreted inaccurately. • Inappropriate economic concepts, theories and principles are used. Inaccurate economic analysis. • Inappropriate or wrong diagrams are used.	1 – 4
Evaluation		

E3	Evaluative judgment on whether rational decision-making by consumers, firms and government will always lead to an efficient allocation of resources are well-explained and supported by economic analysis.	4 – 5
E2	Attempt to explain evaluative comments is incomplete or inaccurate at times.	2 – 3
E1	Evaluative comments are unexplained or not supported by economic analysis.	1