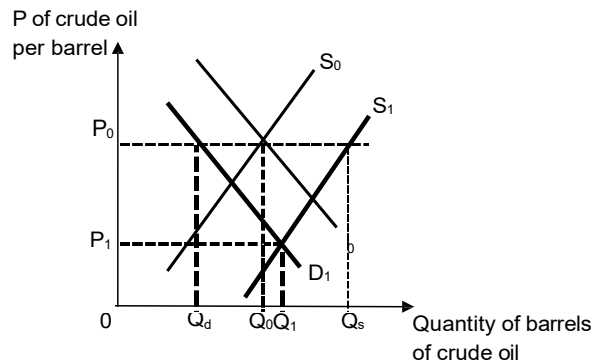


A Level H1 2021 Answer

CSQ1: Intervention in the market for oil

a)	(i)	With reference to Figure 1, summarise the main changes that occurred in the crude oil price during the period 2014-2018.	3
		General Trend: - In general, crude oil prices fell from 2014-2018 [1] Refinements: - There was a <u>steep decline</u> in crude oil prices between middle of 2014 to January of 2015 / second half of 2014. [1] - Crude oil prices experienced a <u>steady rise</u> between January 2016 to January 2018. [1]	
	(ii)	Extract 1 states that ‘If indeed demand for crude oil falls and supply rises, price will be bound to respond in the predicted direction.’ Using a supply and demand diagram, explain the impact of these changes on the price of crude oil.	4
		Demand Directional Change + Determinant + Evidence [1] “China’s economic slowdown, together with a slight downturn in Europe” will result in an overall decrease in demand for final goods and services, as the fall in income would lead to decrease in purchasing power and less demand for final goods and services. Since oil is a factor input of many final goods and services, derived demand for oil will decrease, leading to a fall in demand for crude oil. The demand curve for oil will shift to the left. Supply Directional Change + Determinant + Evidence [1] “In June 2018 the OPEC countries agreed to increase oil production by one million barrels a day” is a government policy that will mandate producers to increase the supply of oil. The supply curve for oil will shift to the right. Price adjustment process [1] When the demand curve for oil shifts left from D_0 to D_1 and the supply curve for oil shifts simultaneously to the right from S_0 to S_1, there is a surplus of oil at the original price P_0 since $Q_s > Q_d$. This causes downward pressure on the price of oil and the price of oil decreases to P_1. Diagram properly labeled and well referenced in answer [1]	

Figure 1: Market for crude oil



b) With reference to Extract 2 and Extract 3, explain the different causes of the changes in the price of oil in the US and price of food in Guatemala and comment on the significance of the elasticity of demand or supply in these cases. 6

Demand Directional Change + Determinant + Evidence [1]

Extract 2 states that the price of oil has fallen to negative. The fall in demand for oil is ultimately a result of government policy to implement “lockdowns across the world...due to the Covid-19 pandemic”. Lockdowns would decrease the demand for many final goods and services such as travel, hospitality, entertainment etc. Since oil is a factor input of most final goods and services, the derived demand for oil will consequently decrease, leading to a decrease in the price of oil in the US.

Application of PES for change in oil prices for the US [1] + significance of PES on change in price [1]

Extract 2 mentions that the fall in demand has caused large surplus that “oil producers are paying buyers to take it away... as storage space has run out on land and sea”, implying the oil producers' have excess stock, i.e. PES is elastic. PES is more than 1.

When PES is elastic, a decrease in the demand for oil → limited fall in price of oil. Hence, the PES of oil is not significant in causing the limited fall in the price of oil.

	Supply Directional Change + Determinant + Evidence [1] Since biofuels and food are in <u>competitive supply</u> where producers use similar resources for the production of both goods, an "expansion of growing crops for biofuels" due to a government subsidy will lead to a <u>fall in the supply</u> of food crops. This large fall in supply of food crops will cause a shortage at the initial price hence upward pressure on price, leading to increase in price of food. Application of PED for change in food prices for Guatemala [1] + significance of PED on change in price [1] Since food is a <u>necessity</u> as expressed by a spokesperson for the Guatemalan farmers "They need food", PED for food is elastic. <u>PED value for food is less than one.</u> When PED value for food is less than one, a decrease in the supply for food, which decreases quantity demanded, will lead to significant increase in the price of food. Hence, the PED will significantly change the price of food, causing food prices to increase sharply. Although the global demand for crops for biofuel has caused much land, even those in Guatemala, to be used for bio-fuel causing large fall in supply of crops for food, The inelastic PED is equally significant, if not more, in causing the sharp increase in food.	
c)	Using one example from Extract 3 and one other example of your choice, explain 'an unintended consequence' of an economic decision in each case.	4
	Economic Decision Identified + Explanation of Unintended consequence 1 [2] The government's decision to introduce subsidies on production of biofuel is to benefit from the rising demand for biofuel: i.e. to increase exports and hence economic growth and at the same time to increase the farmers' income. Increase crops for biofuel for export → increase export revenue → increase AD → multiple increase RNY through the multiplier process, hence increase EG. This would also raise incomes for the farmers, as they would have higher profitability. The unintended consequence was the "sharp increases in food prices". With biofuels becoming more lucrative to producers, more of biofuel crop will be produced and more resources such as land will be dedicated to produce biofuel crop. There will be less land available to produce food crop, which results in the supply of food crop decreasing and the prices of food crop to increase. This worsen equity as 'Guatemala poor people' don't have enough to eat, as they are not able to afford the rise in cost of food. Economic Decision Identified + Explanation of Unintended consequence 2 [2]	

		Government decision to impose price floor on price of crops for food with the aim to encourage farmers to increase the production of crops for food but raising the TR farmers can earn from sale of crops for food. The unintended consequence would be that the price floor on crops for food will lead to surplus of crops → government will have to buy up the surplus to support the price. This increases government's spending → strain on government funds → less fund for public healthcare → low quality public healthcare.	
d)	(i)	With reference to Extract 4: Explain the meaning of both non-rivalry and non-excludability, and comment on the extent to which a healthy natural environment has these characteristics.	6
		Explain what non-rivalry means [1] Non-rivalry in consumption means that consumption of the good by one more person will not leave less for others to consume. As a result, the marginal social cost of providing the good for an additional person is zero. Explain what non-excludability means [1] Non-excludability in consumption means once provided, no one can be excluded from consuming the good, even if they do not pay. As a result, no one will be willing to pay for the good → the price of the good will then be zero. A healthy natural environment has these characteristics [2] From extract 4, a 'healthy natural environment' consists of 'clean air, clean water, unspoilt landscapes and rich biodiversity'. An example of such healthy natural environment is the national park. Assuming clean air is everywhere, and clean water flows from rivers, streams or lakes...etc., when one person enjoys the healthy natural environment, it does not leave less clean air nor less clean water for other people to consume. Hence, it is non-rivalry in consumption. It is impossible to prevent anyone, including non-payers from enjoying the healthy natural environment. It is not economically viable to fence up a national park to prevent non-payers from entering it. As such, it can also be non-excludable in consumption. Comment [2] However, there is a limit to the number of people who can enjoy the healthy natural environment such that it is both non-excludable and non-rivalry in consumption. If there are so many tourists who are visiting the healthy natural environment, so much so that the tourism traffic is causing pollution (e.g. overflowing trash on land and into the waters...etc.), or causing the natural environments to be torn down for urban development..etc, then in such a scenario, having one more person may mean less clean air/less clean water/less unspoilt landscapes and	

		less biodiversity for others to enjoy, and hence it could be rivalrous in consumption. In addition, if the healthy natural environment is such that it turns into a tourist attraction - where high walls or a boundary/barrier/fencing are being erected and an entrance fee is implemented, then it may be possible to exclude non-payers from enjoying the healthy natural environment.									
d)	(ii)	With reference to Extract 4: Discuss whether imposing a tax on oil is the best way to ‘reduce the negative effects of oil consumption on the natural environment’	10								
		<table><tr><td>Command</td><td>Discuss whether- 2 sided answers</td></tr><tr><td>Content</td><td>Policies: Tax, negative externality</td></tr><tr><td>Context</td><td>Oil; natural environment</td></tr><tr><td>Approach</td><td>Introduction Requirement 1: Tax on oil to reduce externality Evaluation 1: Limitation Requirement 2: Alternative policies to reduce externality Evaluation 2: Limitation Conclusion & Overall Synthesis</td></tr></table>	Command	Discuss whether- 2 sided answers	Content	Policies: Tax, negative externality	Context	Oil; natural environment	Approach	Introduction Requirement 1: Tax on oil to reduce externality Evaluation 1: Limitation Requirement 2: Alternative policies to reduce externality Evaluation 2: Limitation Conclusion & Overall Synthesis	
Command	Discuss whether- 2 sided answers										
Content	Policies: Tax, negative externality										
Context	Oil; natural environment										
Approach	Introduction Requirement 1: Tax on oil to reduce externality Evaluation 1: Limitation Requirement 2: Alternative policies to reduce externality Evaluation 2: Limitation Conclusion & Overall Synthesis										

Introduction:

The negative effects of oil consumption on the natural environment represent negative externalities which are generated due to the overconsumption of oil. There is also imperfect information on the part of consumers where they engage in myopic-decision making.

These negative externalities and imperfect information caused by myopic decision making by consumers lead to market failure in the oil market

The government can employ various policies to correct for these types of market failure such as imposing a tax on oil or having a public education campaign about the harmful effects of oil on the natural environment.

R1: a tax on oil 'reduce the negative effects of oil consumption on the natural environment'

A tax helps to correct the market failure by getting consumers and/or producers to internalise the negative externalities of consuming or producing oil.

In order for it to be effective, the government should impose a tax that is equivalent to the extent of the negative externality (i.e. = MEC at Q_s). This causes MPC to shift up to MPC^* . The new Q_f is at $MPC^*=MPB$, and equal to Q_s .

This raises the price of oil to P_3 , forcing consumers to internalise the negative externality in their decision making and to consume oil where $MPC + \text{tax} = MPB$, at output Q_s , in order to maximise their net private benefit.

With the decrease in consumption, the socially efficient level of consumption/output of oil, Q_s is achieved.

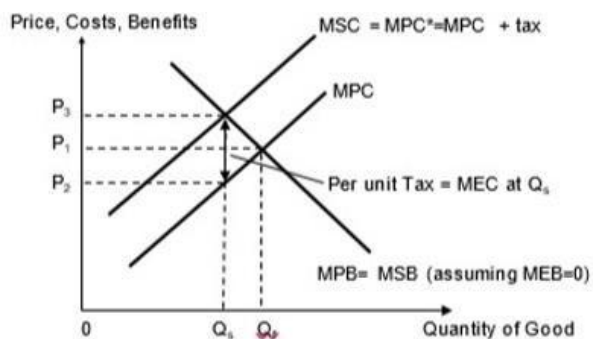


Figure 3: Imposing a tax=MEC on the oil market

Evaluation 1:

Strengths of imposing tax [FEAST: Addressing Root Cause + Side Effect]

A positive side effect of taxes is that it could raise government revenue which can be spent on other policies such as public education to educate producers and consumers about the harmful effects of oil on the natural environment.

Limitation of taxes [FEAST: Effectiveness]

- Tax on oil consumption does not address the issue of oil not being disposed of correctly. Oil that is disposed into the drain will flow into rivers, streams and lakes, hence spill into the natural environment. Extract 4 mentions that this has the same effect as pouring oil directly into the river. Hence although tax reduces the usage of oil towards the social efficiency level, it does not address the negative impact of oil on natural environment.
- Furthermore, taxation might be ineffective since oil is a necessity and price elasticity of demand for oil is inelastic. This means that an increase in the oil price through taxation will only lead to a less than proportionate decrease in quantity demanded for oil. So even though oil prices are substantially higher, the output of oil might not decrease to the socially efficient output.

R2: Public Education to reduce the negative effects of oil consumption on the natural environment'

Another policy that the government can implement is to educate consumers about the harmful effects of oil on the environment which will ultimately harm consumers in the long term.

The government can educate consumers of oil, both the firms and consumers on the importance of proper disposal of oil and the impact of oil spilled and poured into the drains on the rivers, streams and rivers.

The government can also educate consumers on the long-term negative effects of oil on the natural environment caused by overconsumption such as contaminated water which can cause ill health if consumed or higher food prices with lack of irrigation for crops. This will help to bridge the information gap that consumers have from $MPC_{perceived}$ to MPC_{actual} so that consumers reduce their consumption levels of oil to the socially efficient level Q_s , thereby correcting for the market failure.

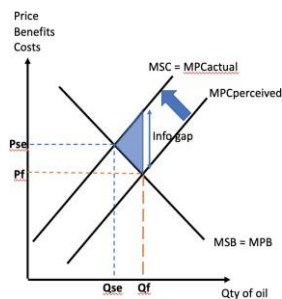


Figure 4: Education bridges the information gap between $MPC_{perceived}$ and MPC_{actual}

Evaluation 2

Strength of Public Education [FEAST: Addresses root cause + Effectiveness]

- Public education on the harmful effects of oil consumption as well as the disposable of oil is the only policy that addresses the root cause of imperfect information due to myopic-decision making. Without it, consumers will not know how their consumption patterns of oil now will result in costs that they will have to bear in the future such as poor health. Public education can also be effective in the long run as it corrects the misperceptions of consumers of oil.

Limitations of Public Education [FEAST: Time, Feasibility]

- However, public education will take a long time to shape habits and consumption patterns that have been reinforced over decades. It is difficult to change the perceptions and attitudes of consumers so this will reduce the efficacy of public education in the short run.
- This policy might also be unfeasible in terms of costs as public education on oil consumption will need to be carried out for decades and will impact government budgets. There is also an opportunity cost incurred in using government funds for public education as opposed to other merit goods such as the building of hospitals or road infrastructure.

Overall Evaluation/conclusion

Weighing & Time: For the most part, most consumers are already aware of the harmful effects brought about by consumption of oil either directly or indirectly. However, most do not consider third-party effects of their consumption of oil. Hence, a tax would be the policy that targets the root cause of the overconsumption of oil. Taxes also take little time to implement and its effects are almost immediate, as opposed to the much longer time taken for public education to take effect. As such, it may be better to implement taxes as a short-run policy, while public education is implemented for the long-run.

Assumptions: The effectiveness of taxes hinges on the assumption that there is sufficient political will for governments to impose taxes on oil which will cause prices of most goods and services to go up. This will have wide-ranging impacts on consumers' purchasing power and material standard of living. Implementing too high a tax could have repercussions on the incumbent's time in office. Furthermore, large corporations which are a primary source of jobs, and government revenue could lobby hard against this policy. So it will take a large amount of political will before such a policy can be implemented.

Knowledge, Understanding, Interpretation, Application and Analysis			
Level	Analysis Level	Descriptors	Marks
L2	A+A A+C C+C C+K/0 A C	Responses in this level will provide detailed analysis on tax on oil and another <i>policy and explain how the 2 policies can address the negative effects of oil consumption on the natural environment.</i> , showing excellent ability to describe and explain relevant economic concepts, theories, and principles in a precise, logical and reasoned manner, with good use of extract evidence.	4-7
L1	K+K K	Responses in this level will have some limited understanding of tax on oil and another <i>policy and explain briefly how they can address the negative effects of oil consumption on the natural environment.</i> There may be some basic content errors and limited or no application of economic concepts, theories and principles.	1-3

Evaluation

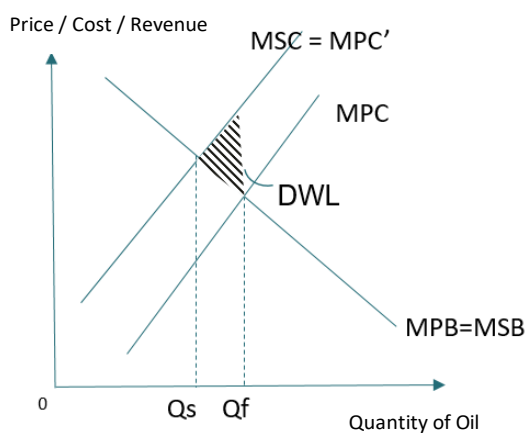
Level	Descriptors	Marks
E3	One well explained evaluative statement or two generic, weakly explained evaluative statements which are supported by the arguments presented in the answer. and a summative conclusion that addresses the question.	3
E2	One well explained evaluative statement or two generic, weakly explained evaluative statements which may not supported by the arguments presented in the answer.	2
E1	One evaluative statement that may be generic, weakly explained or not supported by the arguments presented in the answer.	1

e)	Some people argue that any intervention in markets by government involves so much danger of making the allocation of resources less efficient that non-intervention is the best policy in all circumstances. Discuss the extent to which you agree with this view.	12
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Command	Discuss the extent
Content	Government failure, allocative efficiency/ social efficiency level
Context	No specific context, but preferably oil market, biofuel market, food market, or other markets mentioned in the CS
Approach	Introduction Requirement 1: Government intervention involves so much danger of making the allocation of resources less efficient i.e. govt intervention causes inefficient allocation of resources Evaluation 1: Extent of the danger caused by govt intervention Requirement 2: Non-government intervention is the best policy to allocate resources efficiently Evaluation 2: Some government intervention required in certain markets to achieve allocative efficiency Summative Conclusion

R1: Government intervention involves so much danger of making the allocation of resources less efficient

It is noted that the production and consumption of crude oil has generated negative externalities, which has resulted in an over allocation of resources.



The free market of oil originally consumes/produces at Q_f . A tax equal to the marginal external cost at Q_s is imposed by the government. There is internalisation of the externality, i.e. a tax makes the private firm/consumer take into account the negative externality in their decision making.

This causes the firm/consumer's new MPC to shift up to MPC^* . As a result, the consumer produce consumes until its new $MPC = MPC^* = MPB$, i.e. at Q_s . The allocative efficient output level Q_s is achieved and the deadweight loss is eliminated.

As seen in extract 4, an alternative would be that "oil could be taxed more heavily". However, due to the government's imperfect knowledge, it may not be able to identify the MEC at Q_s accurately. This may cause the government to overestimate the MEC at Q_s and over-tax, which may bring the consumption/production level of oil to below Q_s , and the DWL that results from this over-taxing could exceed the DWL at the free market. In this case, government failure is worse than market failure, and as such, thus there is a danger that intervention could worsen efficiency in the market for oil.

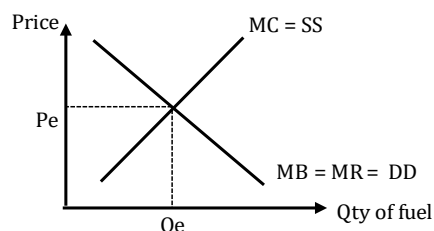
From extract 4, the "sale and production of oil could be regulated more strictly", presumably to achieve the Q_s level of production and sale of oil. However, if the government officials are corrupt e.g. Malaysia or Indonesia, they may be bribed and hence the regulations need not be followed, where some firms may produce more oil and sell them in the black market for higher profits. This would lead to the socially optimum point Q_s not being achieved, and there could be significantly higher production of oil; leading to larger deadweight loss and worsening allocative inefficiency.

Evaluation 1: Extent of the danger of government intervention

- However, the government may be able to implement a tax, equal to the size of the MEC, which would resolve the deadweight loss, as $MPC + \text{tax} = MPB$ at Q_s , and result in the market producing at the socially optimum point. In this case, government intervention may achieve a more efficient outcome.
- From extract 4, the "sale and production of oil could be regulated more strictly", presumably to achieve the Q_s level of production and sale of oil. If the government enacts strict regulation and enforcement (i.e. penalties), there could be no black market emerging, and the market may be able to produce at the socially optimum point.

Requirement 2: Non-Government intervention is the best policy to allocate resources efficiently

In the absence of externalities and imperfection information, the markets can allocate resources efficiently without government intervention, assuming both producers and consumers are rational decision-makers and allocate their resources to maximize their profits and satisfaction respectively. As seen in the diagram below, the rational consumer would consume fuel at quantity Q_e where he satisfaction of the good is maximised at $MB=MC$. Likewise, the rational producer would produce the good at quantity Q_e where he maximises his profit at quantity where his $MR=MC$



The rational consumer would consume as long as the marginal benefit he gains exceeds the marginal cost incurred. The more he values a good, the higher the price he is willing to pay. This signals to producers that there is demand for the good. As rational agents themselves, producers will produce the good because with a higher price, they stand to earn higher revenue and hence higher profits, assuming costs remain constant. Hence more resources are moved into the fuel industry to increase in the production of fuel.

Hence, through price signal (higher price to signal there is increase in price), resources are moved from other sectors where they are less required and allocated to the fuel sector where they are most required and most valued, *ceteris paribus*. By doing so, rational decision-making by consumers and producers result in allocative efficiency.

Any intervention by the government will move the market away from the socially optimal equilibrium and result in market failure. Thus, non-intervention is the superior method.

Evaluation 2: Government intervention may be necessary

However, without government intervention, the free market will allocate resources efficiently assuming there is no market failure. Due to self-interest, consumers and producers will not consider the externality mentioned in extract 4.

Allocative efficiency will also not be achieved in the case of public goods where there is no price signal such as the natural environments with clean air, clean water, unspoilt landscapes and rich biodiversity (Extract 4). In the market of such public goods, where non-excludability results in the free ridership problem and thereby causing no effective demand, together with non-rivalry in consumption, where marginal social cost of provision of the good is zero and thus leads to firms' undesirability to charge a price, therein lies missing market signals and complete market failure. In such a case, government intervention is crucial, otherwise the good will not be provided for in the free market. This include public goods like national defence, street lighting and conversations.

Overall Evaluation/ Conclusion

- Stand: Ultimately, non-intervention is certainly not the best policy in all circumstances.

- Substantiation: It really depends from market to market, depending on the nature of good and source of market failure present, and it also depends on the degree of market failure.
 - When dealing with public goods, it is pertinent that government intervention is required, if not, complete market failure will result in the free market.
 - In the market for biofuel, the government may have to relook at its approach towards biofuel, and perhaps complement it together with other policies in the petrol / crude oil market in order to effectively reduce the negative externalities associated with production of crude oil/diesel/petrol.
- Recommendation: To prevent government failure from being worse than market failure, the pros of implementing a tax on oil is that it can be reviewed regularly and tweaked from time to time to reduce imperfect knowledge and attempt to concertise tax = MEC at Qs as accurately as possible, to prevent over-taxation and therefore government failure from occurring.

Knowledge, Understanding, Interpretation, Application and Analysis

Level	Analysis Level	Descriptors	Marks
L2	A+A A+C C+C C+K/O A C	Responses in this level will provide detailed analysis on 2 opposing perspectives on whether government intervention in markets involves inefficiencies in the allocation of resources that non-intervention is the best policy in all circumstances , showing excellent ability to describe and explain relevant economic concepts, theories, and principles in a precise, logical and reasoned manner, with good use of extract evidence.	4-7
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