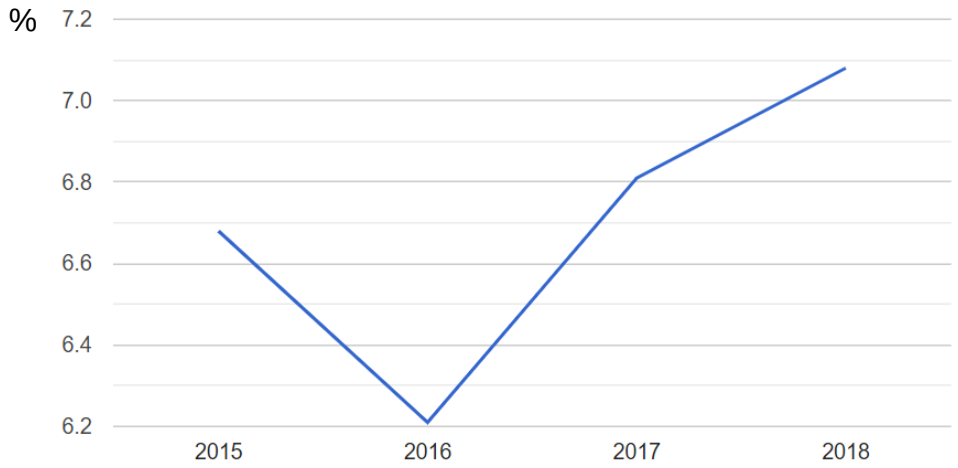
H2 ECONOMICS – PROMOTIONAL EXAM 2020 QP

Section A: Case Study [30 marks]

The economic miracle of Vietnam

Figure 1: Real Gross Domestic Product Growth (%), Vietnam



Source: The Global Economy, 2020

Extract 1: Vietnam – An economic miracle

Today, Vietnam is one of the stars of the emerging economies. Since 2010, Vietnam's gross domestic product (GDP) growth has been at least 5 per cent per year. With such rapid economic growth, the country grew from one of the poorest countries in the world to a comfortably middle-income one. Its GDP per capita has increased ten-fold from US$230 in 1985 to US$2,343 in 2017.

Vietnam's economic growth rivals China's, and its exports are worth as much as the total value of its GDP. With multinational corporations having set up factories, anything from Nike sportswear to Samsung smartphones are manufactured in Vietnam.

So how did Vietnam's growth miracle happen? One key reason, among others, is that Vietnam has invested heavily in human and physical capital, predominantly through public investments. Vietnam made large public investments in primary education and also invested heavily in infrastructure, ensuring cheap mass access to the internet. Armed with the necessary infrastructure and with business-friendly policies in place, Vietnam became a hub for foreign investment and manufacturing in Southeast Asia.

Adapted from World Economic Forum, 11 Sep 2018

Extract 2: Vietnam is getting old

Vietnam has a median age of only 26. But it is greying fast. Over-60s make up 12 per cent of the population, a share that is forecast to jump to 21 per cent by 2040.

This shift in Vietnam's population structure brings headaches. The most recent survey of the old, in 2011, found that 90 per cent of them had hardly any savings. Government spending to support the aged in the country will therefore be on the rise. The International Monetary Fund predicts that pension* costs, at the present rate, could raise government spending as a share of GDP by eight percentage points by 2050.

Adapted from The Economist, 8 Nov 2018

* A pension is an amount of money paid regularly by the government to a person who does not work anymore because they are too old or have become ill.

Extract 3: Vietnam is entering its 'golden period'

Vietnam's GDP growth is projected to decelerate in 2020, remaining nevertheless robust at around 6.8 and 6.9 per cent. Her economic growth momentum will continue in 2020 on the back of strong macroeconomic forecast, a growing middle class, rapid adoption of cutting-edge technologies, and a surging manufacturing industry. Consumption, a key driver of Vietnam's economic growth, will continue to play a major role in the years to come.

With trade tensions between the United States (US) and China still ongoing, Vietnam will remain a favoured destination for shifts in trade flows and foreign direct investment, said analysts. Vietnam has so far taken advantage of emerging opportunities created by the friction and will likely continue to do so because Vietnam has a lot of advantages for US firms wanting to shift manufacturing away from China, including a skilled workforce, and reasonable salaries.

One key challenge for Vietnam will be to increase labour productivity. Vietnam's labour productivity is below regional peers, and the country needs to increase labour productivity by roughly 40 to 50 per cent in order to sustain the economic growth over the next few years.

Adapted from Business Times, 30 Dec 2019

Extract 4: Air pollution in Vietnam threatens economic growth

Vietnam is waking up to the gravity of the country's air pollution problem. People in cities such as Hanoi regularly wear surgical masks. Companies and households have also been installing air purifiers and water filtration systems for their offices and homes. Additionally, they are becoming increasingly concerned about the horrific air pollution caused by tens of thousands of motorbikes and vehicles on the roadways of the capital city and want something done to reduce harmful emissions.

The Vietnam government has formed a panel to address the problem. To address the air pollution from vehicles, the most straightforward and practical solution is for the government to levy a high national fuel tax. Definitely, the behaviour of people will change with such a tax, Fulbright University Vietnam environmental economist Le Viet Phu told the government panel. If people are required to pay more, they will drive less and that will reduce harmful carbon emissions.

At the same time, the debate over a motorbike ban continues to rage in both Hanoi and the southern metropolis of Ho Chi Minh City.

Adapted from Vietnam Net Bridge, 19 June 2017

Extract 5: Rising motorcycle market revving up

The Vietnamese motorcycle market in 2018 broke its sales record set seven years ago with nearly 3.4 million units sold, reflecting a year-on-year increase of 3.5 per cent. With sustained economic growth, the incomes of the Vietnamese have been increasing, leading to increased demand for new vehicles.

In urban areas with narrow streets and long alleys, public transportation meets a very small portion of travel demand. Experts said this deficiency means motorcycles will remain an essential means of transportation because their flexibility and convenience make them suitable for the road conditions of Vietnam.

Source: Vietnam News, 22 January, 2019

Questions

a. Describe the change in Vietnam's GDP between 2015 and 2018. [2]

b. (i) Explain why GDP per capita could be used to measure a country's living standards. [2]

(ii) With reference to Extract 1, explain one reason why the increase in Vietnam's GDP per capita could have overstated the improvement in Vietnam's living standards. [2]

(iii) Explain one additional indicator you would use to determine the extent of improvement in the living standards of the Vietnamese. [2]

c. Using the concept of opportunity cost and a diagram, explain how increased spending by the Vietnam government on pensions for the aged (Extract 2) will impact the country's potential economic growth. [4]

d. Using the evidence in Extract 3, discuss the view that Vietnam's economic growth is expected to remain robust in 2020. [8]

e. If you were an economic advisor to the government of Vietnam, discuss whether you would propose a ban on motorcycles or a fuel tax to reduce vehicle usage, given the country's air pollution problem. [10]

Total: 30 marks

Section B: Essays [50 marks]

Answer **two** questions out of the three choices provided.
You have **1h 30 minutes** to complete this section.

1. In 2019, there was an increase in rice prices in Indonesia. Paddy fields across Java, the main rice growing region in the country, was parched by the unusually long period of dry weather. In the same period, there was a rise in the global price of wheat, another main staple food in Indonesia. As the land in Indonesia is unsuitable for wheat production, the country is fully reliant on imports of wheat.

Source: Various

(a) Explain possible considerations by a government in deciding whether to implement price controls to help more households consume rice. [10]

(b) Discuss the impact of the above developments on the market for rice in Indonesia. [15]

2. Early detection of obesity, diabetes and high blood pressure is important. Making lifestyle changes and treatment of these conditions early can reduce health complications and improve productivity at work. That is why the Singapore government has enhanced the subsidies for Screen for Life, Singapore's national screening programme, and widely publicised the need for screening.

Adapted from Speech by Mr Amrin Amin, Senior Parliamentary Secretary of Ministry Of Health, 29 September 2019

(a) Explain the market failure in the health screening services market. [10]

(b) Discuss whether intervention by the Singapore government will result in a more efficient outcome for the health screening services market. [15]

3. The tariff war between US and China, two of Singapore's largest export destinations, has lasted more than a year. As a result, Singapore's export-reliant economy has been negatively impacted and business sentiment has taken a hit.

Adapted from CNBC, 2 September 2019

(a) Explain reasons for changes in the aggregate demand and supply of a country. [10]

(b) Discuss whether a decrease in investment expenditure will have a more significant impact than a decrease in export revenue on economic growth in Singapore. [15]

H2 ECONOMICS – PROMOTIONAL EXAM 2020
SUGGESTED ANSWERS, MARK SCHEMES & MARKERS' COMMENTS

Section A – Case Study

a)	**Describe the change in Vietnam's GDP between 2015 and 2018**. It rose [1] at a rising rate except in 2016 when it rose at a falling rate [1]. Or It rose [1] at a rising rate in general [1]. **Markers' comments** Content: ● To avoid describing the wrong thing, students need to read the **question** and the **title** of Figure 1 carefully. Skill: ● Some students provided only one observation - for a 2m trend question, two observations would be the norm to score the full 2m.	[2]
b)	i) **Explain why GDP per capita could be used to measure a country's living standards.** GDP per capita is the total income generated from producing a country's total output of final goods and services within its boundaries during a period of time, divided by the country's population. [1] A rise in a country's GDP per head leads to higher purchasing power and more consumption of goods and services per person which increases the material well-being of those living in the country. [1] **Markers' comments** Content: ● A number of students failed to consider the significance of 'per capita', explaining only what GDP means. This would lead to an incomplete response. ● There were also some who misunderstood 'per capita' to mean 'per household'. This is **incorrect**, since 'per capita' would refer to 'per person'. ● Some students failed to make the link between purchasing power and **consumption** of goods and services to improve material well-being. Skill: ● Based on the mark allocation, students may not want to spend too much time explaining how both material and non-material SOL rise with a rise in GDP per capita. In fact, material SOL would be the main focus as it stems directly from GDP per capita.	[2]
	ii) **With reference to Extract 1, explain one reason why the increase in Vietnam's GDP per capita could have overstated the improvement in Vietnam's living standards.** Possible responses (Any **one** of them would be sufficient): Large share of export revenue in GDP The large share of export revenue in GDP will cause the increase in GDP per capita to overstate the improvement in living standards.	[2]

	Although income increases from the increase in exports, not all of this income is being spent on consumption. As such material well-being does not rise to the same extent as GDP per capita. <u>Large Number of MNCs</u> The large number of multinational companies (MNCs) in Vietnam means that a large portion of the profits that are earned from the production of goods and services are being repatriated back to the foreign companies' home country instead of being earned by residents of Vietnam. The actual increase in income of Vietnam's residents would be much smaller than the increase in GDP per capita. <u>Large proportion of investments</u> Large investments in physical capital only increase the amount of capital goods in the economy while the amount of consumer goods which are available for consumption remain unchanged. Although future living standards will increase as the productive capacity can increase with a rise in investments, current living standards remain unchanged. The increases in GDP per capita hence overstates the improvement in living standards in the current period. **Markers' comments** <u>Content:</u> ● Many students brought in the evidence of how investment in human and physical capital will lead to an improvement in future SOL. The explanation seems incomplete if there were no further elaboration that this is at the expense of consumer goods and services for the current generation, thus current SOL is overstated. <u>Skill:</u> ● Many students wrongly matched the impact of investments by MNCs (Ext 1) to impact on non-material SOL through higher pollution levels (the evidence for pollution comes from Ext 4 and the reason for it was due to high motorcycle usage). ● Some students brought in reasons not from the extracts (e.g. non material SOL factors) to explain why real GDP per capita could be overstated. Students need to go beyond a theoretical answer to using the data for application. ● Given that there were clear reasons provided in Extract 1, students are expected to focus on them, as opposed to less direct reasons as mentioned above.	
	iii) **Explain one additional indicator you would use to determine the extent of improvement in the living standards of the Vietnamese.** Possible responses (Any **one** of them would be sufficient): <u>GNI per capita</u> Gross National Income (GNI) measures the income that is earned by the Vietnamese after adding factor income earned from abroad to GDP and subtracting factor income paid abroad from GDP. This is needed because it addresses the limitation of GDP which includes factor income that is generated in Vietnam but paid to foreigners and so does not contribute	[2]

	to the material well-being of the Vietnamese. GDP also excludes factor income that is sent back to Vietnam and contributes to the material well-being of the Vietnamese residents. For a developing country like Vietnam for which the net property income from aboard is likely to be negative, GNI per capita will help address the over-statement of the rise in SOL based on GDP per capita figures.
	
	<u>Gini Coefficient</u>
	
	The Gini coefficient takes a value between 0 and 1 and measures the degree of income inequality within Vietnam. If Vietnam has a high Gini coefficient, it would mean that increases in income may only be earned by the high earners in Vietnam. Living standards of the average resident would only improve by a small extent or may not improve at all when GDP per capita increases.
	
	<u>Composition of GDP</u>
	
	Identifying whether there is an increase in domestic consumption and imports as a percentage of GDP would help to better determine the extent of improvement in living standards when GDP increases. The increase in consumption spending and imports would better measure the actual level of consumption and hence material well-being that Vietnam's residents are enjoying when GDP per capita rises.
	
	Markers' comments
	
	<u>Content:</u>
	● It is correct to suggest the Human Development Index (HDI) as the additional indicator but it is not adequate to merely assert that this can measure both material and non-material SOL. Understanding of non-material SOL needs to be shown and explanation of which component in HDI measures changes in non-material SOL needs to be included.
	● For those who brought in the HDI, mistakes seen include:
	  ● Regarding the number of years of education and health (in terms of life expectancy) as purely non-material, which is not accurate.
	  ● Incorrect naming of the components of the HDI.
	
	<u>Skill:</u>
	● There is a need to show understanding of the interpretation of the additional indicator that is suggested (as opposed to mere identification)
	For example, students who brought in the Gini coefficient simply linked it to how income inequality should be factored in; there wasn't any interpretation of the Gini coefficient first.
	● For a mere 2m question, it is not time-efficient to suggest HDI as the additional indicator because this would have entailed a rather lengthy explanation.	

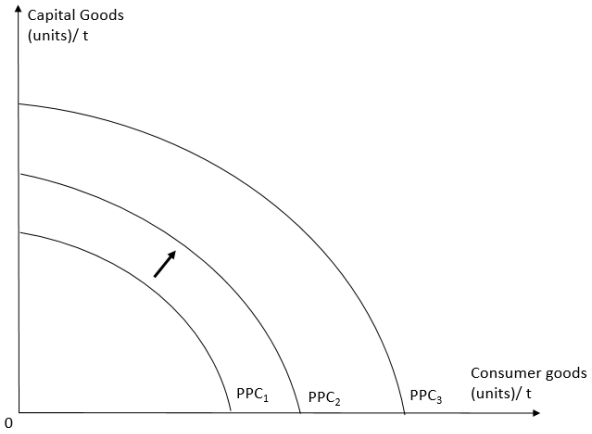
c)	**Using the concept of opportunity cost and a diagram, explain how increased spending by the Vietnam government on pensions for the aged (Extract 2) will impact the country's potential economic growth.** Due to the scarcity of resources, opportunity cost is incurred when resources are used in the form of the net benefit of the next best alternative foregone. When the Vietnamese government chooses to spend more on pensions, it very likely will be spending less on investment in human or physical capital, given its limited tax revenue. This means more resources in the country will be channeled into producing consumer goods/services (since the aged will be spending their pensions on consumption) and hence less resources in the country will be used for capital goods production. A possible opportunity cost would be the benefit from spending on investments foregone, which is a higher rate of potential growth.	[4]

Option 1: PPC shifts right to a smaller extent due to lower spending on physical capital.

A lower spending on investments would cause the country's capital stock to grow more slowly, assuming that the lowered level of investment still exceeds capital consumption. This leads to a smaller increase in the productive capacity of Vietnam's economy. There is lower potential growth as seen from a smaller outward shift of the PPC curve from PPC_1 to PPC_2 instead of PPC_3 if there were higher investments.

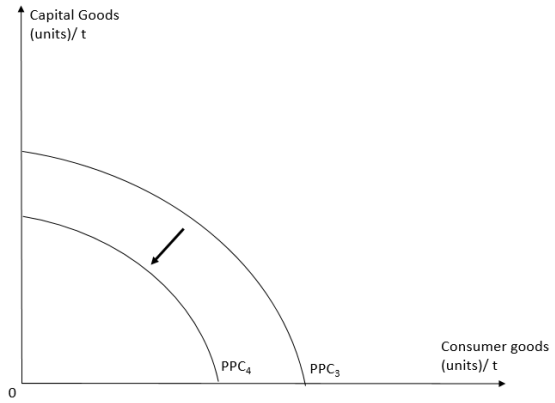
Option 2: PPC shifts right to a smaller extent due to lower spending on human capital.

The decrease in spending on human capital will cause labour productivity to grow more slowly as less workers will have access to these educational or training courses. This would slow potential growth as the maximum possible output of the economy would grow more slowly. The lower potential growth is seen from a smaller outward shift of the PPC curve from PPC_1 to PPC_2 instead of PPC_3 if there were higher investments in human capital.



Option 3: PPC shifts left

If the amount of investments is less than depreciation, the country's capital stock will fall. This will cause the country's productive capacity to fall, resulting in negative potential growth. This results in an inward shift of the PPC from PPC_3 to PPC_4.



Markers' comments

Content:

- The concept of 'opportunity cost' is not well-explained. Examples of poor explanation include
  - Failure to highlight that it is the **net benefit** that could be gained from the **next best alternative use** of the resource, which is **sacrificed** when the government spends more on pensions,
  - Failure to link the incurring of opportunity cost to **scarcity** given limited government revenue / resources.

- For the concept of opportunity cost, students should address only one other alternative instead of listing a range of other areas the government could have spent on as there can only be one use that is the next best alternative.
- When the AD-AS diagram is used to illustrate the impact on potential growth, there should be explicit reference to the extent or direction of change in **the full employment national income level (Yf)** and not mere mention of the extent or direction of change of the shift of the vertical segment of the AS curve.
- The following are examples of **incorrect** labelling of the PPC diagram:
  - Labeling one of the axes as pensions
  - Labeling the axes as price and quantity
  - Labelling the axes broadly as Good A and Good B. Since the question is about potential growth, the focus of the trade-off is about consumer good versus capital goods and so one axis should be measuring the quantity of capital goods and the other the quantity of consumer goods produced during a period.
- The labels for the PPC diagram were frequently missing - make sure to label diagrams properly, otherwise they will be deemed incomplete.
- Answers for which the diagram showed movement along the PPC but did not show any shifting of the PPC were inadequate because the question is about potential growth.
- Answers that asserted that a fall in the level of investment led to an inward shift of the PPC were not adequate because there was failure to compare the level of investment with the level of capital depreciation. On its own, less investment would not mean that the quantity of capital has fallen.
- Answers that merely asserted that a reduction in spending on investment would have led to a reduction in the quantity and quality of FOP were far too vague to warrant earning the 'explanation' marks.
- Some students incorrectly linked the increase in government spending in pensions to an increase in G, hence a shift of AD. Firstly, this answer is not answering the question as the question requires the application of 'opportunity cost'. Secondly, pension is a form of transfer payment which is not in G, but will impact Cd.

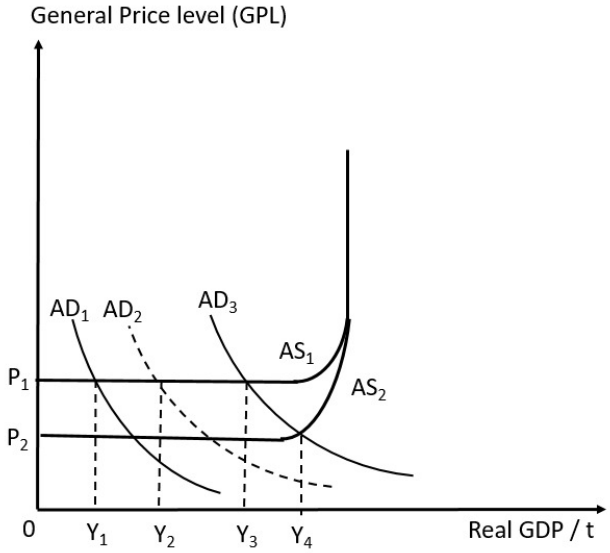
<u>Skill:</u>

- Students must learn to pay attention to the content requirements of the question, which is the impact of increased spending by the government on pensions.

  The following shows misinterpretation of the question:
  - Explanation of the impact of the ageing population
  - Explanation of other consequences of increased government spending on pensions like reduction in savings or a decrease in labour force should elderly workers choose to retire. While these answers are possible impacts on Vietnam's potential growth, they were not acceptable answers to the question which is about the **opportunity costs** of increased spending on pensions (e.g. less funds available for spending on infrastructure).
- Some students correctly identified that the government spending more on pensions implies less spending in capital goods. However, the subsequent explanation focused on what happens when the government spends on capital goods (i.e. AS / PPC shifts right and Yf increases), and then concluded that because the government did not spend on capital goods, the rise in Yf does not happen.

  Learning point: Students should **<u>answer the question directly</u>** and illustrate what will happen when the government does not spend on capital goods, rather than to explain what will not happen.

	● Rather than focusing on capital goods as the opportunity costs, a better answer would focus on the impact on potential growth as the net benefit forgone from the decreased spending on capital.	
d)	**Using the evidence in extract 3, discuss the view that Vietnam's economic growth is expected to remain robust in 2020.** <u>Introduction:</u> Economic growth is expected to remain robust in 2020 as real GDP is expected to increase by "around 6.8 and 6.9 per cent". <u>Thesis:</u> [P] Vietnam's economy will experience robust growth in 2020 due to the increase in foreign investments. [E&E] Vietnam's status as a "favoured destination for shifts in trade flows and foreign direct investment" in light of the US-China trade war will increase investments and cause an increase in AD as investments are a part of AD. AD shifts right from AD_1 to AD_2. This will cause an unplanned fall in inventories and firms will hire more factors of production in order to increase output. The additional factor income generated will induce households to increase spending on domestically produced goods/services besides inducing higher level of saving, spending on tax payments and imports. The country's national output thus rises further until national output equilibrium is restored at Y_3 when total injections equals total withdrawals in the circular flow of national income. [L] Overall, there is thus an increase in Vietnam's real GDP by the rise in investment multiplied by the multiplier. [P] The fall in Vietnam's unit cost of production (UCOP) is another reason that Vietnam's economic growth is expected to remain robust. [E] The "adoption of cutting-edge technology" improves factor productivity. [E] This means that firms need to hire fewer factors of production to produce the same amount of output, resulting in a fall in UCOP. AS increases. Horizontal AS shifts downward and the AS curve shifts from AS_1 to AS_2. [L] The rise in AS will result in surpluses in the economy and downward pressure on prices causing GPL to fall. The fall in GPL will cause a rise in AD (movement along AD) due to the real balances effect, as consumers enjoy an increase in purchasing power and subsequently increase consumption. This will cause real GDP to rise from Y_3 to Y_4. With both AD and AS rising, Vietnam's equilibrium real GDP rises strongly from Y_1 to Y_4.	[8]



Anti-Thesis:

[P] Vietnam's low labour productivity growth could be a reason why increases in real GDP will be limited causing economy growth to be unable to remain robust.
[E] As stated in extract 3, Vietnam needs to increase its labour productivity in order to sustain its economic growth.

[E] Vietnam's low labour productivity growth would mean that increases in AD can easily bring the economy to full employment level as productive capacity is increasing at a slow rate.
[L] At this point, further increases in AD will only cause GPL to increase and not have any impact on real GDP.

[E] Low productivity growth could also lead to increases in UCOP if wage rates rise faster than labour productivity. This increase in UCOP will cause AS to fall which is represented by horizontal AS shifting upwards, resulting in an increase in GPL.
[L] As GPL increases, AD falls (movement along AD) due to the real balances effect as consumers decrease consumption due to the fall in their purchasing power. This will cause real GDP to fall.

Conclusion:

[Stand] Vietnam's economic growth is likely to remain robust in 2020 given the current economic trends.

[Possible Substantiation] AD growth due to increase in FDI is likely to continue in the future given the prolonged trade war between US and China. Vietnam's status as a highly favoured destination for manufacturing will mean that foreign firms who are looking for alternatives to China as their manufacturing base would find Vietnam suited as a substitute for their manufacturing in China. Thus, the rise in AD will be significant.

Although Vietnam might be faced with low labour productivity, the rapid adoption of cutting-edge technology will offset the negative impacts of low labour productivity growth. The adoption of cutting-edge technology is likely to be in a large no. of sectors, as Vietnam's workforce is likely to be able to learn the new technology due to the government's high level of investment in human capital. This could overcome the challenge of having to increase labour productivity.

Even though wage rate could rise faster than productivity if the labour productivity increase is too limited, Y_f can still rise since the labour force is likely still expanding in spite of the ageing population. With the expansion in the country's productive capacity, increases in AD will be able to result in increases in real GDP. Moreover, given Vietnam's status as a developing country, it is likely that there is still a lot spare capacity in the economy and increases in AD will not bring the economy to Y_f yet.

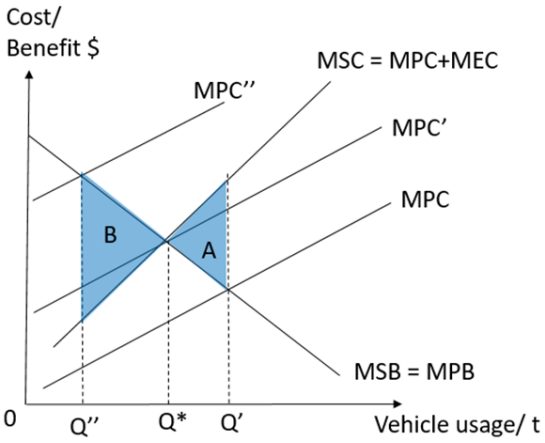
Knowledge, Application/ Understanding, Analysis		
Levels	**Descriptor**	**Marks**
L2	● Analytical explanation of factors from the case that impact AD & AS and hence growth rate. ● Answer addresses reasons why economic growth in Vietnam might and might not be robust in 2020.	4 – 6
L1	● Descriptive explanation of factors from the case that impact AD / AS and hence growth rate ● Answer does not explain how shifts in AD-AS lead to changes in GDP ● Answer is one sided ● Answer contains conceptual errors when using the AD-AS model to explain economic growth in Vietnam.	1 – 3
E	● Clear stand with substantiation that is based on evidence / context of Vietnam ● For 2m, 1 point on extent of rise in AD and 1 point weighing the extent of fall in AS/rise in AS is needed for a complete evaluation.	1 – 2

Markers' comments

Content:

- Robust growth is not the same as sustained growth; when we consider if growth is 'robust' or strong, we're focusing on increases in real GDP i.e. actual growth. There is no need to write about Yf and potential growth and if these were considered, they should be linked to how the slow potential growth could constrain the rise in equilibrium national output (i.e. Ye).
- Many students linked a "growing middle class" to a rise in income, and then proceeded to explain how a rise in income would shift the AD curve, which is incorrect. At equilibrium, national income remains the same unless AD and/or AS changes.
  Learning point: A shift in AD is due to changes in autonomous factors (i.e. non-income factors and non-GPL factors).
- A "growing middle class" also does not mean a rise in quantity of labour.
- There was confusion about the meaning of a low level of labour productivity. It is wrong to say that a low level of labour productivity, ceteris paribus, leads to a fall in the AS.
  Learning point: 'Low' is not the same as 'falling'. So, rather than saying that low productivity leads to a fall in AS, it should be 'the lack of ability to increase labour productivity would have constrained the rise in Vietnam's potential national output, and this could have slowed Vietnam's AD-driven actual growth'.
- There were some students who equated consumption being 'a key driver of Vietnam's economic growth,' to mean that MPCd is large. That is **incorrect**. The Extract is saying that C as a % of GDP is large (hence consumption is a key driver of Vietnam's economic growth), and does not contain evidence for MPCd. Neither is it saying that consumption will increase.

	Skill: ● There was a failure to read the question carefully. Some students concluded that Vietnam can't grow robustly in the long run. However, the question is about growth in 2020. ● Students must learn to write in a way that **show economic conceptual understanding** rather than merely indicate their understanding of mathematics. For example, many students wrote that because AD = C+ I + G + X - M, when I increases, AD will increase. Rather than merely cite the 'equation', understanding should be shown that when I increases, there is more expenditure on domestically produced capital goods. This is what leads to an increase in AD. ● Students must learn to strike a good balance between breadth and depth of analysis. There is no point covering many AD factors because for 6m, a more balanced response would have required consideration of the AS factors and how the change in AS impacted the country's equilibrium real national output. ● Similarly, do not over-explain the workings of the multiplier for this question. That being said, there is a need to explain **how** the increase in AD will lead to an increase in real national output. It is insufficient to read off your diagram and says that AD now cuts AS at a higher level of output. ● Also, do not merely assert that low productivity growth will be a hindrance to robust growth. An explanation should be given about how the hindrance to potential growth would mean real GDP may not rise when AD rises.	
e)	**If you were an economic advisor to the government of Vietnam, discuss whether you would propose a ban on motorcycles or a fuel tax to reduce vehicle road usage, given the country's air pollution problem.** Introduction: Respiratory health problems suffered by residents in Vietnam from the air pollution that arises from use of motor vehicles is a negative externality. In deciding whether to implement a ban on motorcycle use or a fuel tax, I would consider the effectiveness of improving allocative efficiency and the extent of trade-off with the objective of equity in distribution of resources created by the measure. Body: [P] Pursuit of self-interest leads to over-consumption of motor vehicles and welfare loss for society. [E,E] Motorists only consider their marginal private costs and marginal private benefits when deciding whether to use their motor vehicles. As such, vehicle use (Q') is greater than the socially optimum level (Q*) where marginal social benefits (MSB) equals marginal social costs (MSC). This causes deadweight loss of Area A because the MSB<MSC for those units. [L] There is thus allocative inefficiency. The excessive use of motor vehicles adds to the air pollution in Vietnam's cities.	[10]

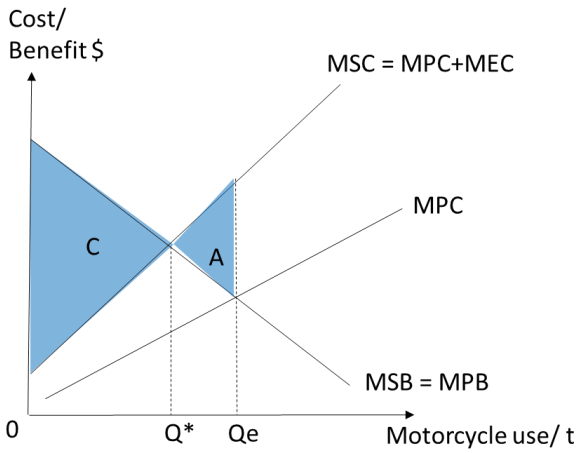


[P] A fuel tax would be able to reduce vehicle usage in Vietnam.
[E,E] A fuel tax is a "straightforward and practical solution" (Extract 4). A fuel tax is imposed by the government to increase the marginal cost of vehicle use as each litre of fuel is now more expensive. With perfect information, the government could choose to impose a fuel tax which increases MPC by MEC at Q*.

This will cause marginal private cost of driving to increase causing MPC to shift from MPC to MPC'. As motorists are made to internalise the MEC of their actions, they will choose to drive up till MPB equals to MPC'. Thus, private equilibrium quantity falls, coinciding with the socially optimal equilibrium (i.e. vehicle use falls to the socially optimal level where MSC = MSB) and resulting in a removal of the initial deadweight loss.

[L] A fuel tax would therefore work to reduce vehicle usage in Vietnam.

[Ev] However, it is hard to measure the external costs of air pollution as its negative effects are only felt after a long period of exposure. As such, it is hard to accurately monetise the MEC of vehicle use. In this case, the government might over tax fuel, resulting in MPC shifting to MPC''. This results in an under usage of vehicles at Q'' and subsequently results in an even greater deadweight loss to society (Area B).



[P] The Vietnam government could also impose a ban on motorcycles to reduce motorcycle use.
[E,E] A ban on riding motorcycles will prevent motorcycles from using the roads. Use of motorcycles will fall to zero. This will remove the air pollution that is generated from the motorcycle use and hence the deadweight loss to society from overconsumption.

However, this leads to an under-consumption of (Q*-0) units and such an under-consumption lead to welfare loss of Area C. At Q*, there is a net social benefit to

society (Area C) from motorcycle use as some of Vietnam's urban areas have narrow streets and long alleys (Extract 5) which are inaccessible to cars and public transport. Area C is likely to be larger than area A.

[L] If area C was smaller than area A, a ban could improve society's welfare.
Conclusion:
[Stand] A fuel tax would be a more effective and appropriate policy as compared to a ban.

[Substantiation] A fuel tax will likely result in an improvement in society's welfare as compared to a ban on motorcycle use. Imposing a ban is a blunt policy which will likely lead to a worsening of society's welfare due to over-correction. This is due to the high MSB of using motorcycles, given their "flexibility and convenience (Extract 5), which makes area C very large. Hence a ban on motorcycles will likely lead to a greater deadweight loss to society as compared to a tax.

Also, a ban on motorcycle use will lower equity of distribution in private transport as motorcycles are a key mode of transport in cities of developing countries like Vietnam. The public transport system is not developed enough to cope with the increase in passengers as it is not as suited to Vietnam's roads (Extract 5). Given that cars are more expensive, the distribution of transport in Vietnam will be more inequitable if a motorcycle ban were put in place.

Knowledge, Application/ Understanding, Analysis		
Levels	**Descriptor**	**Marks**
L2	● Analytical explanation of the 2 measures ● Directly addresses the question – to reduce vehicle usage in order to solve the problem of negative externality ● Answer is clear in terms of explaining how the polices will affect the decision making of motorists (fuel tax) and motorcyclists (ban)	4 – 7
L1	● Descriptive explanation of the 2 measures or analytical explanation of only 1 measure ● Conceptual mistakes in explaining how the policies work to reduce market failure in Vietnam. ● Max 2m for students that are only able to explain the cause of market failure.	1 – 3
E	● Clear stand with substantiation that is based on at least 2 evaluation criteria and consideration of the context of Vietnam. ● One of the evaluation criteria should include 'effectiveness in improving welfare'.	1 – 3

Markers' comments

Content:

- The analysis to explain the fuel tax and its impact on motorcycle usage is not clearly established and vague. Students need to explain the link clearly and state which market they are referring to in the diagram.
  For example,
  - If a motorcycles market diagram is used, then the impact of a fuel tax on the motorcycles market will be in terms of lowering the market demand for motorcycles (complementary demand relationship between fuel and

motorcycles). It is erroneous to say that fuel is a factor input in the production of motorcycles and then move on to say that the fuel tax will drive up the MPC of producing motorcycles.
    - If a cost-benefit diagram is used, then it is correct to say that a fuel tax drives up the MPC of *using* motorcycles (or any vehicles).
- Students' explanation of the welfare loss created by a ban tends to be problematic.

  When the starting point is from the market equilibrium quantity (Qe), the welfare loss with a ban (that causes consumption to fall from Qe to 0) is not the welfare at socially optimal level of consumption as the welfare loss from overconsumption needs to be subtracted away. So the welfare loss based on the diagram in the answers is C-A and **not** just C. Many students compared welfare loss after ban with welfare loss without government intervention. It would be more direct to compare the **welfare** before and after intervention. After intervention, welfare is 0. Before it is C-A. So, if C>A, the government shouldn't intervene with a ban.

  Note: Regarding the welfare loss at output = 0 to be just Area C, it is correct if the response angled it as 'a ban leads to underconsumption *with respect to the socially optimal level of output* i.e. underconsumption of 0 to Q* units, which leads to a welfare loss of area C.

- It is **incorrect** to say that the welfare loss of over-consuming motorcycle rides is equal to the external cost. Do note that part of the external cost is actually covered by the TSB.
- There was a tendency to associate the usefulness of motorcycles to the low MEC of motorcycles / rides. This is **incorrect**. It should be associated with the high level of the MSB of motorcycles.

  Learning point: High MSB is not the same as low MEC.

- Many diagrams were not labelled properly, or were wrong (e.g. in the ban diagram, SS curve intersects the x-axis and does not reach Q=0).

<u>Skill:</u>

- Students should not waste time explaining the market failure at length because the focus of the question was on the 2 measures.
- Students who evaluated by using generic limitations (e.g. lack of information to determine the correct level of fuel tax) would not have scored the full marks because of the lack of consideration of the context (Vietnam).
- There was an attempt by many students to use the context to support their evaluation but the substantiation tended to be descriptive. A stronger evaluation would have linked the context (high reliance on motorcycles) to the size of the welfare triangle at the socially optimal level of motorcycles/rides.
- With regards to the relative size of the welfare loss triangles, attempts to explain why Area C is likely to be bigger than Area A were weak.
  Learning point: You need to explain why MEC is likely to be small/large and explain that MSB of using motorcycles will be high/low.
- Students must take care to ensure that the diagrams (e.g. whether MEC is big or small, or resultant welfare loss before or after ban is bigger or smaller) matches the written analysis.
- Some students took the problem listed in the question at face value i.e. air pollution problem, and failed to consider what the economic problem here is i.e. allocative inefficiency. Without establishing the problem clearly, explanations of the policies will be descriptive and lacking in rigour.

Section B – Essays

1. In 2019, there was an increase in rice prices in Indonesia. Paddy fields across Java, the main rice growing region in the country, was parched by the unusually long period of dry weather. In the same period, there was a rise in the global price of wheat, another main staple food in Indonesia. As the land in Indonesia is unsuitable for wheat production, the country is fully reliant on imports of wheat.

Source: Various

(a) Explain possible considerations by a government in deciding whether to implement price controls to help more households consume rice. [10]

(b) Discuss the impact of the above developments on the market for rice in Indonesia.

[15]

Answer Outline – Part (a)

R1: Explain one consideration by a government in deciding whether to implement price controls to help more households consume rice (potential benefits of the policy).
R2: Explain one consideration by a government in deciding whether to implement price controls to help more households consume rice (potential costs of the policy).

Other considerations – constraints. Note that this is a decision-making question, so benefits and costs from the point of view of the decision-maker (in this case, the govt), should be your first 2 requiremetns.

Introduction

- **Definitions** – Price controls refer to the policies of maximum price and minimum price. A maximum price is the maximum permissible price that producers may legally charge for a particular good or service, while a minimum price is the minimum permissible price that producers may legally charge for a particular good or service.
- **Approach** – The two microeconomic goals of a government are efficiency and equity. This essay will examine the considerations that a government will take in deciding whether to implement a maximum price to help more households consume rice.

Body

[P] In deciding whether to implement a maximum price to help more households consume rice, one possible consideration taken by a government would be the **potential benefit of the policy.**
[E+E] A government would have to consider the potential benefit of improving equity in deciding whether to implement the maximum price.

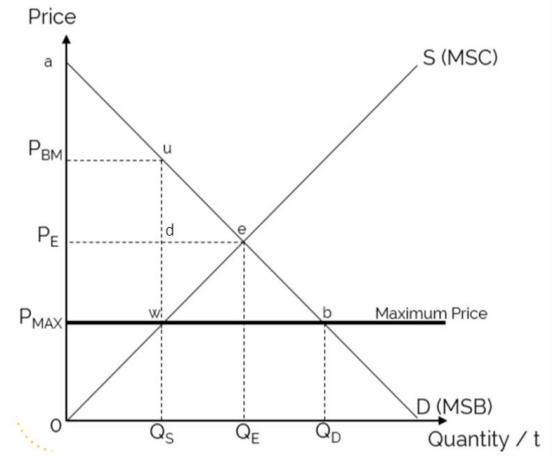


Figure 1: Maximum Price in the Market for Rice

The implementation of a maximum price (P_{MAX}) below the market equilibrium price (P_E) can improve equity as rice will be made more affordable. Previously, households would need to be willing and able to pay P_E to obtain rice; now, being willing and able to pay P_{MAX} would be sufficient. Implementing a maximum price interferes with the price mechanism as the market would not be able to adjust back to equilibrium. As such, the price of rice is lower at P_{MAX} instead of P_E, allowing more households to be able to afford rice and equity in the distribution of rice to be improved. However, not everyone would be able to buy the rice, as only Q_S units will be sold now.
[L] Therefore, a government would consider the **potential benefit of improving equity** in deciding whether to implement a maximum price in the market for rice.

[P] Another possible consideration that a government would take in deciding whether to implement a maximum price to help more households consume rice would be the **costs that may be incurred** from implementing the policy.
[E+E] A government would need to consider the cost associated with implementing the maximum price to decide whether it has the ability to undertake the policy and its financial sustainability. If the costs are high (and exceeds the benefits) of implementing the policy, the policy should not be implemented, and vice versa.

In the case of a maximum price, it is a highly cost-effective policy since the government does not incur high costs, apart from some monitoring and administrative costs associated with implementing alternative allocation systems to deal with the shortage that arises.

Moreover, the government would also consider the trade-off with efficiency in deciding whether to implement a maximum price. Assuming that the market was allocative efficient prior to the intervention, implementing a maximum price would lead to welfare loss for society.

With the implementation of the maximum price below market price, there is an inherent shortage created at price P_{MAX} of Q_DQ_S. The quantity sold drops from Q_E to Q_S. The quantity sold is now less than the socially optimal level of output i.e. Q_E. For each of the $Q_S – Q_E$ units, the increase in total social benefit (area under the MSB curve) is greater than the increase in total social cost (area under the MSC curve), if those units were to be produced. Welfare loss of Area uew results.

Note: Area uew is also the sum of the loss of consumer and producer surplus from the reduction in the number of units sold which are not transferred to anyone. Students can also explain the welfare loss by considering changes in consumer and producer surplus instead.
[L] Thus, the government would consider the **costs that may be incurred** from the implementation of the maximum price in their decision making.

[P] Lastly, a government would also consider **any possible constraints** in deciding whether to implement a maximum price to help more households consume rice.
[E+E] The government would consider if there are constraints in terms of manpower and institutions in their decision to implement a maximum price. At P_{MAX}, there is a shortage of Q_D-Q_S rice in the market, since quantity demanded (Q_D) of rice exceeds the quantity supplied (Q_S). If the shortage is prolonged, black markets may emerge, where rice would be sold illegally at a price above the legal price ceiling. As seen in Figure 1, should a black market arise, the black-market price of rice could be as high as P_{BM} as that is the highest price that consumers are willing and able to pay for Qs units of rice. This would thus undermine the intended objective of the policy, which is to increase the affordability of rice for more households. If there are constraints in terms of manpower and institutions, such that there cannot be sufficient monitoring and enforcement to prevent the emergence of the black market, then the government might not want to implement the maximum price.
[L] Therefore, the government would consider **any possible constraints** in deciding whether to implement a maximum price to help more households consume rice.

Note:

1. It is acceptable if students bring up the consideration of government budget (on the enforcement of the policy) in deciding whether to implement a minimum price and buy up the surplus to distribute to households.
2. Students may phrase their points differently, e.g. governments may consider the trade-off with allocative efficiency; so long as they are relevant, they will be accepted.
3. Since the decision in the question is whether to implement price controls, it would not be accepted if students bring in the level of maximum price / minimum price as a consideration.

Mark Scheme

Level	Descriptor	Marks
L3	**Knowledge + Application + Analysis** ● An answer with at least three well-explained considerations ● Answer makes reference to the context of rice	8 – 10
L2	**Knowledge + Application** ● An underdeveloped answer or one that has gaps in the explanation of the factors that a government needs to consider in deciding whether to implement price controls	5 – 7
L1	**Knowledge** ● Contains theoretical errors ● Mere listing of points without explanation	1 – 4

Markers' comments

Content:

- This question was the most poorly done of all the questions. But there was a good attempt by a minority of students who showed a good grasp of how governments make policy decisions and what they would consider in their decision making.

- The explanation of how price ceilings work and the unintended consequences of a price ceiling (e.g. shortage, black market, etc.) tended to be incomplete.
    - Most students were not able to explain how the price ceiling keeps the price of rice low very rigorously. The main essence of the price ceiling is to disallow frustrated consumers from bidding up the price due to the law that producers cannot sell beyond Pmax. This means that the price mechanism is not allowed to work to clear the shortage, capping the price level at Pmax which also unintendedly creates a persistent shortage of Qd - Qs.
    - There also seems to be an assumption among a lot of students that a price ceiling is automatically implemented with a first-come-first-serve allocation system. This is not true. Governments can implement a price ceiling together with other forms of allocation systems such as 1-per-household for a fairer distribution.
    - Students who brought in the possibility of black markets emerging were generally not able to identify the black-market price P_{BM} on the diagram and explain why that is the highest price consumers are willing and able to pay in the black market. Additionally, students often mention that black markets would result in social instability. This is often true but a stronger (more economic) point would have been to critique how the emergence of a black market where consumers have to pay a high price to secure the good defeats the very purpose the price ceiling intended to do.

- Students who regarded the problem of affordability as a market failure have misused the concept.
  - **Learning point:** Market failure refers to the failure of the price mechanism to bring about allocative efficiency.

- Many students could not explain why or how the implementation of a price ceiling results in allocative inefficiency.
  - While some students tried to bring in consumer and producer surplus, they could not correctly explain that while producer surplus decreased, consumer surplus may increase or decrease, and that there is an overall deadweight loss to society. The identification of the welfare loss in their diagrams are also wrong.

<u>Skill:</u>

- Weaker scripts did not answer 'to the question' but focused on the effects of price ceilings. Such answers also tended to be structured poorly, such that responses sounded as though they were addressing the limitations of price ceiling.
  - **Learning Point:** Students need to learn how to tailor their understandings to suit the content requirements of the question. Students need to recognise that for such questions, there is a need to include cost-benefit analysis, constraints, etc.
    - For example, because one consideration by the government would be about whether the policy can effectively solve the problem at hand, students could have used this paragraph to elaborate on how the policy is supposed to work.
    - And with fiscal constraints being another factor that governments consider, students, in elaborating on the monetary cost of the scheme, could have brought in how alternative allocation mechanisms like 'issue of vouchers to poor households' would have entailed rather high administrative costs.

Answer Outline – Part (b)

Note: As this question was set prior to the R1/R2 system, it is quite difficult to split this question into R1 and R2. How you can consider the R1/R2 split is as such:

R1: Explain impact of DD factor on market for rice in Indonesia.
R2: Explain impact of SS factor on market for rice in Indonesia.

However, it still makes more sense to explain the two factors together and combine the analysis into a single diagram, with a single MAP explanation, then do the 2-step process to examine the impact on TR.

Introduction
The effects of the above developments on the market for rice in Indonesia can be examined using demand and supply analysis. The concepts of price elasticity of demand (PED) and cross-price elasticity of demand (XED) would be used in the analysis to determine the impact on equilibrium price, equilibrium quantity, and total revenue in the market for rice in Indonesia.

Body
[P] The supply of rice in Indonesia decreased due to random nature shocks.
[E+E] The unusually long period of dry weather which has parched paddy fields is a random nature shock that has destroyed paddy fields in Java, Indonesia. The destruction of the paddy fields has resulted in a fall in farmers' ability to supply rice, leading to a fall in supply.
[L] The supply therefore falls and the supply curve shifts left from S to S'.

[P] The demand for rice increased due to a rise in the price of wheat, another main staple consumed in Indonesia.
[E+E] XED measures the responsiveness of demand of one good to a change in the price of another good, ceteris paribus. As both rice and wheat are staple food in Indonesia, they are substitutes that can both be used to satisfy hunger. Thus, the XED of rice with respect to a change in price of wheat is positive. A rise in price of wheat will result in a fall in the quantity demanded for wheat and a rise in demand for rice, as consumers can switch to purchase the relatively cheaper rice.
[L] As such, the demand for rice rises and the demand curve shifts right from D to D'.

[Ev] The fall in supply will likely outweigh the rise in demand of rice. Even though rice and wheat (used to make noodles or cereal) are considered to be substitutes, they are weak substitutes as the taste and texture of the two goods are not very similar. The XED of rice with respect to a change in price of wheat is therefore positive but small, and a rise in price of wheat would result in a less than proportionate rise in demand for rice since some consumers may not perceive them as good substitutes. The demand curve for rice thus shifts marginally. On the other hand, the unusually long period of dry weather has dried up paddy fields across Indonesia's main rice growing region, which implies a significant fall in the supply of rice since flooded paddy fields is a requirement for the growth of rice crops.

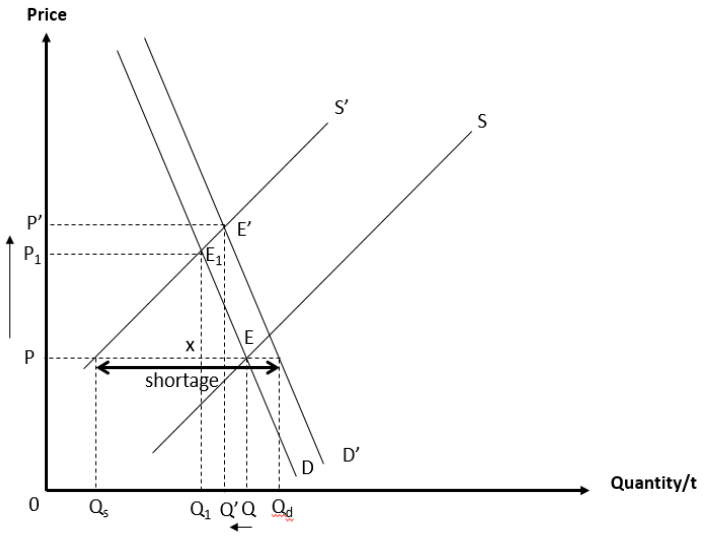


Figure 2: Market for Rice in Indonesia

[P] As a result of the simultaneous fall in supply and rise in demand, and with the fall in supply outweighing the rise in demand, equilibrium price will rise and equilibrium quantity will fall.
[E+E] As seen in Figure 2, the initial equilibrium point is at E, where the demand curve, D, intersects the supply curve, S. The equilibrium price and quantity are P and Q. As a result of the simultaneous shifts in demand and supply, a shortage is created at the original price level, P, since quantity demanded is greater than quantity supplied. This leads to an upward pressure on price as frustrated consumers bid up the price in order to obtain the good. As price rises, quantity demanded falls and quantity supplied rises, as shown by the movements along the new demand and supply curves. The process will continue until the new equilibrium point E', where quantity demanded equals to quantity supplied again.
[L] Hence, the equilibrium price rises from P to P', while equilibrium quantity falls from Q to Q'.

[P] To analyse the impact on total revenue, which is price x quantity sold, the impact of the changes in supply and demand on total revenue will be analysed sequentially.
[E+E] Holding demand constant at D, the fall in the supply curve from S to S' will lead to a rise in price from P to P_1 and a fall in quantity from Q to Q_1. The demand for rice is likely to be price inelastic since there are not many close substitutes to rice that has the same taste, texture and are in the same price range. As such, the rise in price from the fall in supply would result in a less than proportionate fall in quantity demanded, ceteris paribus. Since the gain in revenue from the rise in price (area PP_1E_1x) would be more than the fall in revenue from the less than proportionate fall in quantity demanded (area QQ_1xE), total revenue would therefore increase from area 0PEQ to area $0P_1E_1Q_1$ as we move from the equilibrium point E to the intermediate point E_1.

Holding supply constant at S', the rise in demand will lead to a rise in total revenue from area $0P_1E_1Q_1$ to area 0P'E'Q' since both price and quantity sold increases.
[L] Since the impact on total revenue from both the demand and supply shifts reinforce each other, total revenue will increase overall.

Conclusion
[Stand] In conclusion, based on the above analysis, the developments would result in a rise in equilibrium price, a fall in equilibrium quantity, and a rise in total revenue in the market for rice in Indonesia.
[Substantiation] However, the impact of the above developments on the market for rice in Indonesia may be different in the long run. In the long run, the demand for rice would be more price elastic as consumers would have more time to source for alternatives. Thus, holding demand constant, the rise in price from the fall in supply will lead to a more than proportionate fall in quantity demanded (if |PED| >1). As a result of the fall in supply, total revenue will fall instead since the increase in revenue from the rise in price will be smaller than the decrease in revenue from the more than proportionate fall in quantity demanded.

Over time, as the Indonesians' diets change, consuming more products made of wheat flour, rice and wheat may be seen as closer substitutes with XED value that is large and positive. In that case, given that the price of wheat is rising, the demand for rice will rise more than proportionately. If the rise in demand is significant and outweighs the fall in supply, equilibrium price and quantity will both rise, and total revenue will still rise overall.

The above analysis is also based on the assumption of ceteris paribus, which may not hold in reality. Given the importance of rice to the Indonesians, it is possible that Indonesia will choose to import more rice in the event of the prolonged dry spell. If that is the case, supply of rice will increase in Indonesia, in part offsetting the fall in supply of rice from the poor weather. The price increase will therefore be smaller in such a case, as well as the increase in total revenue.

Mark Scheme

Level	Descriptor	Marks
L3	**Knowledge + Application + Analysis** ● A clear and accurate analysis of changes in both supply and demand with accurate application of relevant elasticity concepts. ● Answer makes reference to the context with relevant examples provided. ● Answer provides a clear and accurate analysis of the impact on equilibrium price, equilibrium quantity, and total revenue/expenditure with the use of a well-labelled diagram.	8 – 10
L2	**Knowledge + Application** ● An underdeveloped answer or one that has gaps in the explanation of how the events affect the market for rice. ● Gaps in the analysis of how the events impact the market for rice. ● Incomplete application of XED and PED or limited reference made to the concepts. ● Some reference to the context given in the pre-amble.	5 – 7
L1	**Knowledge** ● Contains theoretical errors ● Mere listing of points with little or no explanation	1 – 4
E3	**Well-reasoned judgement** ● Justified conclusion and evaluation regarding the impact of the events on the market for rice in Indonesia o Well-substantiated judgement on relative extent of DD and SS shifts o Critically evaluates different possibilities and questions assumptions	5
E2	**Largely unexplained judgement** ● Some attempt at a conclusion or evaluation regarding the impact of the events on the market for rice in Indonesia o Incomplete analysis of relative extent of DD and SS shifts o Attempts to consider different possibilities and perspectives but not clearly explained or elaborated	3 – 4
E1	**Unsupported judgement** ● Mainly unexplained or unjustified judgement and conclusion regarding the impact of the events on the market for rice in Indonesia	1 – 2

Markers' comments

Content:

- The argument that a drought will lead to a fall in supply should be linked to lowered ability to offer rice for sale rather than to both lowered ability and willingness because the point is not about a factor that impacted profit margins.

- Students who mistook wheat as a factor of production for rice ended up with only a supply side shift and this became a limitation to their analysis and evaluation.

- Elaboration of XED application was still weak. Many students simply made assertions i.e. rise in price of wheat leads to an increase in demand for rice as they are substitutes, instead of linking it to consumers switching to the relatively cheaper substitute and hence causing an increase in demand for rice.

- There was still confusion of the use of 'availability of close substitutes' as a PED factor and 'closeness of relationship' as XED factor. Some students used them interchangeably, which is **incorrect**.

- Many students are using PED and PES to justify the relative shifts of the demand and supply curves. This is a **misconception** because **what determines the extent of shifts in the demand and supply curves are the demand and supply factors themselves**.

    - For example, dry weather in Java, a rice growing region in Indonesia will result in a fall in supply of rice. But how can we determine if the fall in supply is marginal or significant? We have to look at the factor more closely. In this case, there was an unusually long period of dry weather in the main rice growing region. This suggests that the fall in supply is likely to be significant.

    - **Learning Point:** Students must remember that PED and PES cannot be used to determine if the changes in DD or SS are marginal or significant (because PED and PES looks at movement along the curves only); the demand and supply factors themselves are used.

- The explanation of how simultaneous changes in demand and supply impact TR using a 2 part sequential analysis has significantly improved, but there remains gaps in understanding.

    - **Learning point:** The overall impact on TR is dependent on the relative strength of each effect in the 2-part analysis and not only whether DD or SS shifted by more (for the case of the final equilibrium price and quantity changing in opposite directions).

Skill:

- A small minority of students are still wasting precious exam time by doing 'single shift' analysis first before moving on to 'simultaneous shifts' analysis.

- Many students did not conclude the changes of the equilibrium price and equilibrium quantity after their price mechanism analysis. Failure to do so technically means that the script did not address the question. On the larger scale of things, it suggests that students do not understand the purpose of bringing in the price mechanism analysis, which is essentially to conclude how the market is impacted via changes in the equilibrium price, equilibrium quantity and TR/TE. This is worrisome as it suggests pure memory work without truly understanding the purpose of using it. Such study technique is going to be ineffective when it comes to answering questions that are less straightforward and students should rethink their way of studying for economics at the 'A' levels.

- Although PED and PES were well justified, students merely included them in separate paragraphs; there were no signs of application, especially for how PED can be used when supply changes, holding demand constant, to derive TR/TE.

- Many students did not justify the relative shifts of the demand and supply curve. Even though in this case, a fall in supply and a rise in demand would have resulted in a shortage all the same, the change in equilibrium quantity would have been ambiguous unless students made an assertion on which curve shifted more. Failure to do so would have resulted in an incomplete analysis which limits the rigour.

    - **Learning point:** Students need to remember to justify relative shifts of DD and SS in their answer whenever a double-shift analysis is required for similar questions.

- For the evaluation, students should not overdo the criticism of the ceteris paribus assumption. This assumption is a requirement in comparative static analysis. And when students *elaborate* on other factors that have changed, then they have actually digressed from the question. A more appropriate way to evaluate is to consider how the impacts of the changes in the 2 factors could differ in different time periods, given the context (the country) of the question.

- Also, while many students tried to evaluate, most stopped short at offering different possibilities without linking it to how the outcome on equilibrium price, equilibrium quantity or TR/TE will be different from their main analysis.

    - For example, some students who asserted that demand for rice is price inelastic in their main analysis evaluated that it may be price elastic in reality due to the presence of other substitutes such as wheat, another staple food in Indonesia. This is a valid argument but needs to be elaborated for it to be a rigorous evaluation, e.g. “thus TR may have fallen instead as a fall in SS will lead to rise in price which subsequently leads to a more than proportionate fall in quantity demanded”.

2. Early detection of obesity, diabetes and high blood pressure is important. Making lifestyle changes and treatment of these conditions early can reduce health complications and improve productivity at work. That is why the Singapore government has enhanced the subsidies for Screen for Life, Singapore's national screening programme, and widely publicised the need for screening.

Adapted from Speech by Mr Amrin Amin, Senior Parliamentary Secretary of Ministry Of Health, 29 September 2019

(a) Explain the market failure in the health screening services market. [10]

(b) Discuss whether intervention by the Singapore government will result in a more efficient outcome for the health screening services market. [15]

Answer Outline – Part (a)

R1: Explain one source of market failure in the health screening services market (consumer ignorance).
R2: Explain another source of market failure in the health screening services market (positive externalities).

Introduction

Health screening services are under-consumed because of consumers' failure to recognise their true benefits to the consumers themselves from the consumption of the services and disregard for the external benefits that could be enjoyed by third parties. This results in society's welfare not being maximised, thus causing market failure in the health screening services market.

Body

[P] There is consumer ignorance in the market for health screening services which results in market failure
[E] Due to imperfect information, consumers may be ignorant and thus underestimate the true benefits of consuming health screening services for themselves. For example, consumers may not be aware that they could benefit from health screenings through early detection of diseases, even when there have been no symptoms of the diseases. Early detection of a condition means
this could help inform consumers of the next course of action to treat the problem early as late treatment could be extremely costly. It also gives consumers better control over their health by making lifestyle changes. Consumers' perceived marginal private benefits of health screening services are thus lower than the true marginal private benefits that health screening services may bring.

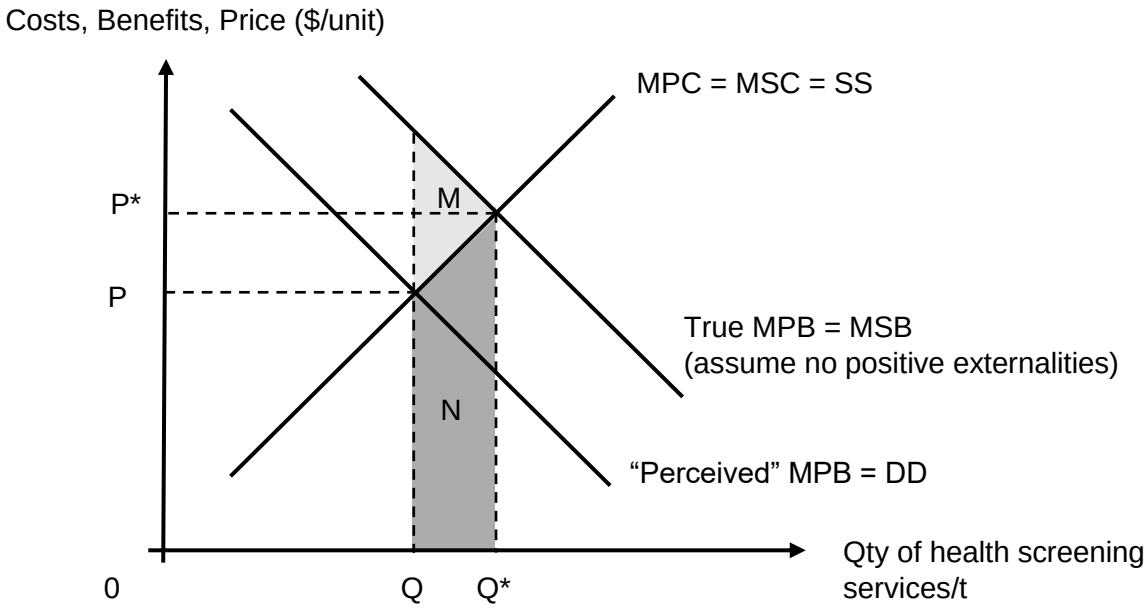


Figure 1: Consumer Ignorance in Health Screening Services Market

[E] Hence due to ignorance, consumers under-estimate the true benefits that consuming health screening services provide. This causes the perceived marginal private benefit (MPB) to be lower than the true MPB of consuming health screening services. Under the free market, market equilibrium output is determined by demand and supply. Consumers would base their consumption decision on their perceived MPB rather than true MPB, thus the demand (DD) would only reflect perceived MPB. The marginal private cost of producing the health screening services by firms is shown by the MPC which is also the supply curve. Under the free market, market equilibrium output is Q where DD=SS.

However, the socially optimal output is at quantity Q*, where MSB = MSC and societal welfare is maximised. Hence, under the free market, there is an under-consumption of health screening services of Q* - Q units. For Q to Q*, the true MPB to consumers (i.e. MSB) is greater than the MSC, which means that there is a net gain to society's welfare that can be reaped if there was greater consumption of health screening services. At the market output of Q, a deadweight welfare loss of area M is incurred by society, as the total social benefit (area M+N) of consuming Q to Q* units is greater than the total social cost (area N).

[L] Therefore, the free market has failed to achieve allocative efficiency as society's welfare is not maximised, and thus causes market failure.

[P] There is presence of positive externalities in the market for health screening services which results in market failure.

[E] The consumption of health screening services not only benefits individuals; early detection of diseases could also benefit other people such as employers. They enjoy a positive externality from consumption of health screening services, which is an external benefit to third parties not involved in the consumption or production of the good. Health screening services and early detection of diseases could lead to better treatment outcomes for employees. Their employers stand to benefit from lower absenteeism and higher healthcare costs savings (from less employee health benefits paid out in the event of future medical complications). Furthermore, there may be better concentration and increased productivity when employees take measures to ensure their own good health.

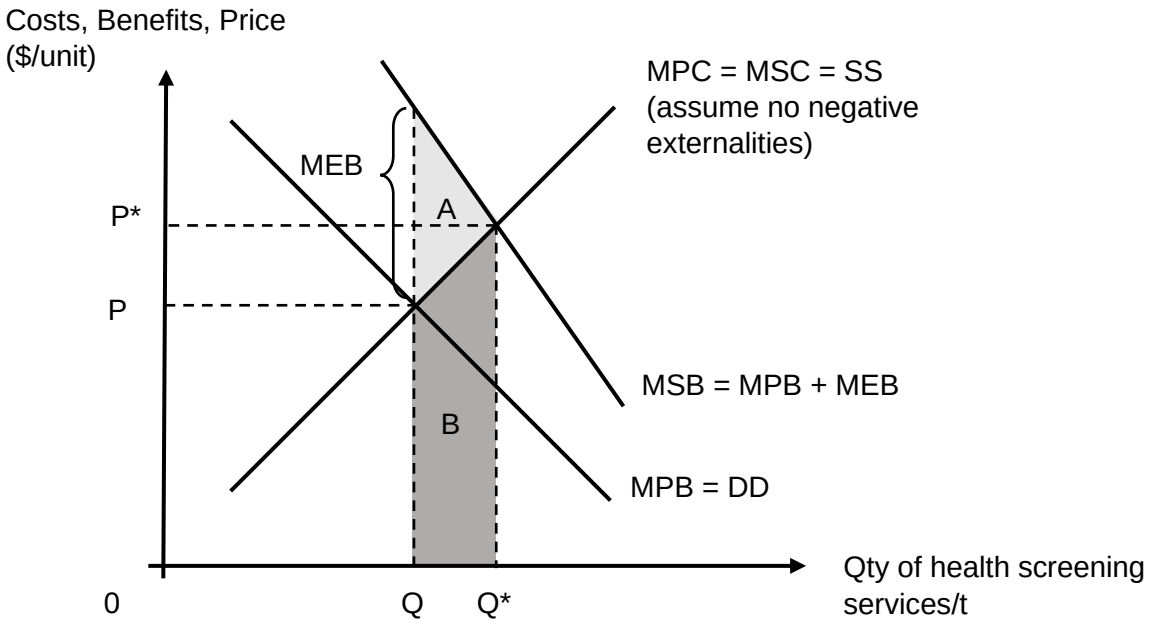


Figure 2: Positive Externalities in Health Screening Services Market

[E] The marginal external benefit (MEB) due to the positive externality causes the marginal social benefit (MSB) to be greater than the marginal private benefit (MPB) of consuming health screening services. Under the free market, consumers will base their decisions on their MPB to maximise their self-interest, and disregard the external benefits. Assuming there is no negative externalities, MPC = MSC. Left to market forces, the market equilibrium output will be at Q where demand equals supply.

However, the socially optimal output is at Q*, where MSB = MSC and society's welfare is maximised. Hence, under the free market, there is an under-consumption of health screening services by Q* - Q units, resulting in welfare loss to society. This is because for Q to Q*, the MSB is greater than the MSC, i.e. there is a gain to society's welfare if Q* - Q more units of health screening services are consumed. At the market output of Q, a deadweight welfare loss of area A is incurred by society, as the total social benefit (area A+B) of consuming Q to Q* units is greater than the total social cost (area B).

[L] Therefore, the presence of positive externalities and consumer ignorance cause society's welfare to not be maximised, and thus result in market failure in the health screening services market.

Mark Scheme

Knowledge, Understanding, Application, and Analysis		
Level	**Descriptor**	**Marks**
L3	● Well-explained answer that demonstrates understanding of how consumer ignorance and positive externality lead to market failure in the case of health screening services ● Diagrams are used appropriately and accurately ● Includes contextualised examples in the explanation	8-10
L2	• A good and thorough explanation of **<u>either</u>** positive externalities or consumer ignorance OR ● Under-developed answer with gaps in the explanation of how consumer ignorance and positive externality lead to market failure	5-7
L1	● Demonstrates understanding of what market failure / positive externalities / information failure / merit good is ● Knowledge of concepts with little or no explanation ● Conceptual errors and inaccuracies in explanation	1-4

Markers' comments

<u>Content:</u>

- One of the most common issues is the weak contextualisation of health screening services. Many students, in their attempt to explain consumer's ignorance or positive externalities, claimed how health screening can help consumers to lower the risks of getting a disease or to prevent third parties from getting a disease without linking it to early detection and intervention. Such an explanation is incomplete and sounds like contextualisation of vaccination rather than health screening services. Students who try to contextualise consumers' ignorance also often stop short at how it can help consumers get early intervention but do not go further to explain why that is "beneficial" to them such as incurring lower medical costs in the future before health complications kick in.

- Many students are also not able to identify relevant third parties and the benefits that they enjoy very explicitly in their attempt to contextualise positive externalities of health screening services.

- Wrong identification of the welfare loss area is common and when this is repeated for both causes of market failure, it is an indication that the students have not really understood the diagrammatic illustration of net TSB i.e. welfare for the under-consumed units.

- Although less common, a fatal error was when students could not differentiate between positive externalities and consumer ignorance.

<u>Skill:</u>

- While students tend to be able to explain the diagram, they were not actually explaining why the under-consumption occurred and this is done by explaining that the market demand is too low due to the ignorance about the true MPB and the disregard for the MEB when consumers pursue the self-interest of maximising net TPB of consumption.

- Students should note that the MPC (labelled as SS) in the market failure diagram is the MPC *of production*. On the other hand, the MPC of consumption incurred by consumers is the price of the good that are being charged by the firms.

Answer Outline – Part (b)

R1: Explain how government intervention by the SG government may result in a more efficient outcome for the health screening services market. **R2**: Explain how government intervention by the SG government may **not** result in a more efficient outcome for the health screening services market.

Introduction

As mentioned in (a), there is market failure in the case of health screening services due to presence of positive externalities and consumer ignorance. Whether intervention by the Singapore government will result in a more efficient outcome will depend on whether her policies can solve all root causes of market failure and reduce allocative inefficiency in the market.

Thesis: Government intervention may result in an efficient outcome for the health screening market.

[P] Government intervention through a subsidy may address the presence of positive externalities and hence result in an efficient outcome

[E] Subsidies are implemented on producers to encourage the production of good and services. To correct the problem of positive externalities in the market of health screening services, the government can fund a per unit subsidy on health screening services equal to the MEB at the socially optimally output, Q*.

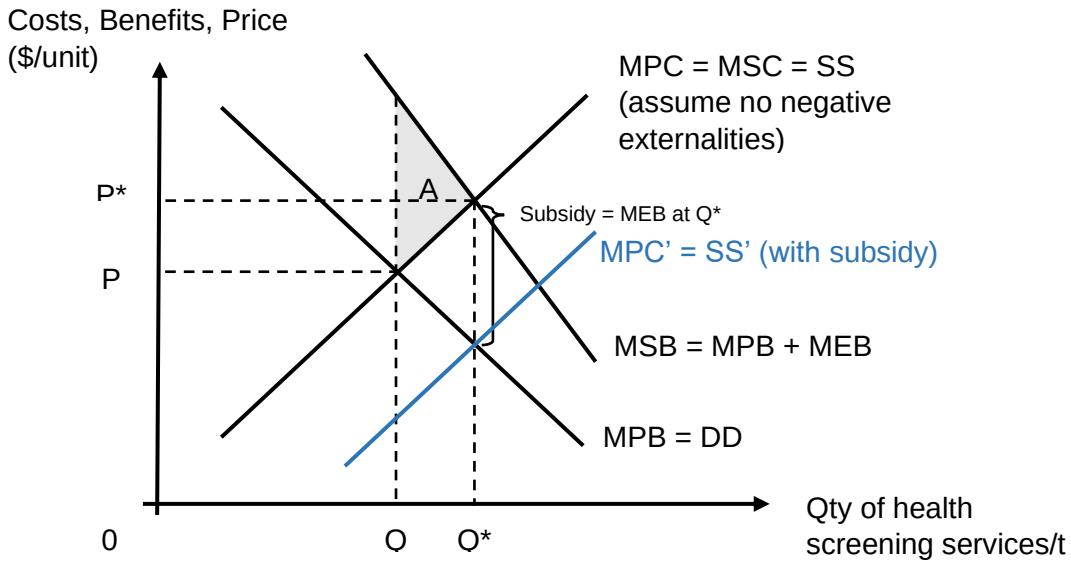


Figure 3: Subsidy in Health Screening Services Market

[E] A subsidy will decrease the price of consuming health screening services and incentivises consumers to internalise the external benefits of consuming the services. The subsidy reduces the producers' marginal private costs of production (MPC), causing supply to rise. SS curve (MPC) will shift vertically downwards to SS' (MPC') by the amount of MEB at Q* as shown in Figure 3. With the increase in supply, a surplus is created at the original equilibrium price, thus driving down prices. By making health screening services cheaper, consumers will be encouraged to consume the services. The subsidy has thus changed price signals to bring about a rise in quantity demanded for health screening services.

Assuming the government has perfect information and is able to estimate the subsidy amount accurately, the subsidy results in a rise in market equilibrium output from Q to Q*. The new market equilibrium output (where SS' = DD) coincides with socially optimal output Q* (where MSB = MSC) level, causing the welfare loss of area A to be eliminated and allocative efficiency to be restored.

[L] If the new market equilibrium output coincides with the socially optimal output level Q*, the deadweight loss to society (area A) would be eliminated and allocative efficiency will be achieved. And even if the amount of subsidy is insufficient, the fall in price will reduce underconsumption of health screening services, resulting in a more efficient outcome.

[Ev] Given that the demand for health screening services is likely to be price elastic since it can take up a high percentage of one's income, even a small subsidy is likely to be effective in increasing the consumption of health screening services. This is because the fall in price from the subsidy is likely to result in a more than proportionate rise in quantity demanded for the services. This will thus address the under-consumption problem and result in a more efficient outcome.

Alternative
[Ev] Given that the demand for health screening services is likely to be price inelastic since there are few close substitutes for health screening services (e.g. full body or cancer indicator screen tests), a large subsidy is required to increase consumption of health screening services to the socially optimal output. This is because the fall in price from the subsidy is likely to result in a less than proportionate rise in quantity demanded for the services. Hence, if the amount of subsidy is small, this may limit the effectiveness of the policy in addressing the under-consumption issue, resulting in limited improvement in allocative efficiency.

[P] Government intervention through public education may address the presence of ignorance and hence result in an efficient outcome

[E] Public education helps to address the problem of consumers' ignorance due to imperfect information as they educate consumers on the true marginal private benefits of consuming the health screening services. The government can and has been carrying out publicity campaigns such as road shows to educate the public. This includes providing information about the potential health risks one can uncover in the screening process. By providing information and recommendations on the types of screening services that one should go for, individuals will be able to more accurately value the private benefits of going for the screening services. This reduces the extent of information failure in the market and encourages the consumers to consume more of the services as they improve their individual decision making.

[E] With public education, consumers are aware of the true marginal private benefits of consuming health screening services. Hence, the perceived MPB for health screening services will increase closer to the true MPB. This also increases the consumers' willingness to consume health screening services and DD increases (based on the higher MPB). In the event that such public campaigns are perfectly successful in closing the information gap such that the perceived MPB aligns with the true MPB = MSB, the private equilibrium output, Q, will coincide with the socially optimal output, Q* and the initial welfare loss of area M in Fig 1 will be eliminated.

[L] If the market equilibrium quantity matches the socially optimal quantity to be consumed at Q*, then allocative efficiency will be achieved.

[Ev] Nonetheless, such publicity campaigns usually require a longer time to observe the desired effects. The effects are also less certain as they involve changing of mind sets and are also highly dependent on consumers' receptiveness to receiving the information. This means that in the short run, intervention by the government may not necessarily result in a more efficient outcome. The success of the campaign also depends on how wide the outreach is.

Alternative policy – Free Provision

[P] Government intervention through free provision of health screening services may address the presence of ignorance and hence result in an efficient outcome

[E] The Singapore government could provide health screening services for free. This has been done specifically for the Pioneer Generation in Singapore, where elderly above 65 will be able to undergo health screening at CHAS (Community Health Assist Scheme) Clinics free of charge.

[E] Initially, the free market equilibrium is at Q, where DD = SS. When health screening services are offered for free, its price is lowered to zero and quantity demanded rises to Qf units. Thus, with free provision, there would be a potential welfare gain of area A, as the units Q to Q* are now consumed. At the same time, as the total social benefit (TSB) from the overconsumption of units Q* to Q' is less than the total social cost (TSC), there is welfare loss of area C.

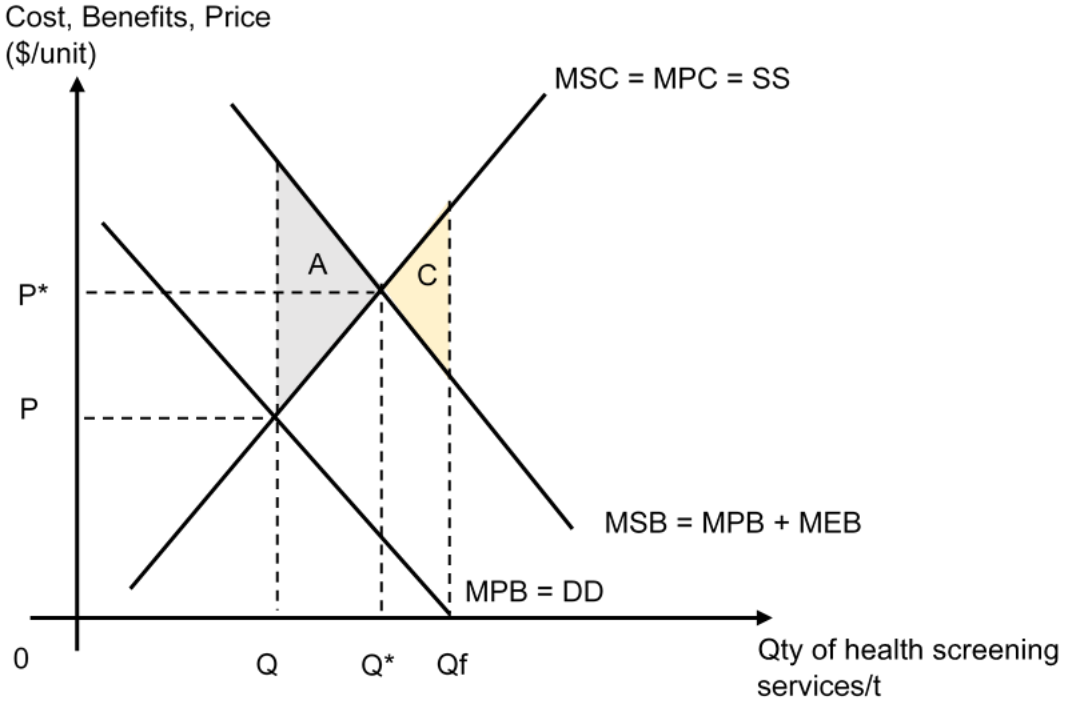


Figure 4: Free provision of health screening services

[L] In the situation where the initial market failure i.e. extent of market failure without government intervention (Area A) is large, such that the welfare loss from government intervention (Area C) is smaller, government intervention through free provision would result in an improvement in allocative efficiency.

Note: It is possible to argue that free provision would not lead to a more efficient outcome if Area A is smaller than Area C instead as an anti-thesis argument.

Anti-thesis: Government intervention may not result in an efficient outcome for the health screening services market.

[P] Government intervention may not result in an improvement in efficiency if the government has inaccurate information.

[E] The government may not be able to determine accurately the extent of MEB. This could be due to imperfect information and difficulty to monetise the external benefits on third parties. Thus, the amount of subsidy given to health screening firms may not be accurate. If the government implements a subsidy that is too high, government intervention may actually lead to a less efficient outcome.

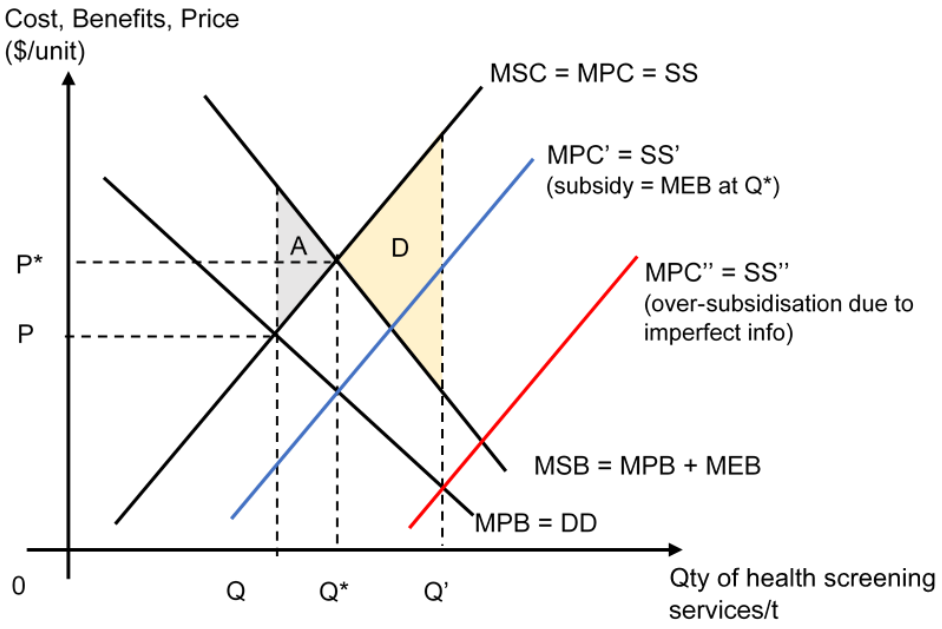


Figure 5: Subsidies in the health screening services market

[E] In the case where the government implements too high a per-unit subsidy which exceeds the MEB significantly, it leads to MPC falling by a larger extent to MPC'', causing the new market equilibrium output to be at Q' in Figure 5 above. This leads to an over-consumption of Q*Q'. The additional benefit obtained from consuming Q*Q' is less than the additional cost incurred by society, resulting in a net social cost of Area D. This deadweight loss may exceed that of Area A, which is the initial deadweight loss present in the market, demonstrating that government intervention can possibly lead to a less efficient allocation of resources and hence may not result in an improvement in efficiency.

[L] Thus, government intervention may not result in an improvement in efficiency if the government does not have accurate information.
[P] Government intervention may not result in an improvement in efficiency if the costs of the intervention exceed the benefits from the intervention.

[E + E] The implementation of the health screening programme through the above policies may attract the wrong target group, e.g. the lower risk, younger populations or individuals with more knowledge. This means that the resources may be inefficiently allocated as they are diverted away from higher risk, ignorant or older populations who are more likely to benefit from such screening.

Moreover, government expenditure on health screening is ultimately borne by the taxpayers, so this implies that there may be a higher burden on taxpayers to foot the bill for the subsidies and publicity campaigns. Tax rates in other product markets may have to increase and this could result in welfare loss in those markets. Higher tax rates can also have a detrimental effect on economic growth, which potentially could add to the costs of the intervention.

[L] Thus, government intervention may not always improve allocative efficiency if the costs of the intervention exceed the benefits.

[Ev] In Singapore, majority of the population is educated and health-conscious. Many of the people are likely to be well informed of the benefits and go for health screening services. The extent of consumer ignorance is thus not likely to be significant and welfare loss is minimal. If the government has been spending a lot on its publicity campaigns, it is possible that cost incurred outweighs the benefit of the campaigns, leading to a less efficient outcome.

For the case of Free Provision
[Ev] However, Singapore's free provision policy is extremely targeted in providing health screening services for the elderly in the Pioneer Generation (elderly above 65 years old) at select CHAS Clinics. Since this policy targets a smaller segment of the population who are at higher health risk, the benefits from providing free health screening services will likely outweigh the lower implementation costs, as opposed to providing for the entire Singapore population.

Conclusion
[Stand] Overall, government intervention to correct both sources of market failure would largely result in a more efficient outcome for the health screening market in Singapore, assuming that the policies used are effective for the target group.

[Substantiation]
These measures could be effective given the target group of higher risk, ignorant or older people in Singapore. This is because the sources of market failure (both positive externalities and consumer ignorance) tend to be larger for this group, due to the higher health risks associated with them. By focusing policies (subsidies, public education and free provision) e.g., through the introduction of CHAS on the Pioneer and Merdeka Generations, the positive impact of government intervention will be large as the market failure is corrected.

On the other hand, the measures may not be effective if households do not follow up with medical treatments and changing their lifestyle choices after the health screening services. Such actions require changes in mindset which may be difficult. One factor could be due to the highly stressful working culture in Singapore, which may hinder working adults from finding time to exercise or seek medical treatment. Furthermore, there has been an increase in medical costs over time, which may deter low-income households to seek full medical treatment.

Overall, from a societal perspective, the incremental benefit of investing in health screening services must be considered alongside the myriad other health care needs of the population in Singapore. Given that Singapore is facing a fast aging population, such investment in increasing screening should be placed a high priority, with government intervention likely to result in a more efficient outcome.

Mark Scheme

Knowledge, Understanding, Application, and Analysis		
Level	**Descriptor**	**Marks**
L3	● Well-explained and balanced answer that analyses whether government intervention improves allocative efficiency. ● Diagrams are used appropriately and accurately ● Includes contextualised examples in Singapore from the preamble (acceptable policies include subsidies, public education, free provision and transfers)	8-10
L2	● Under-developed answer with gaps in the explanation on whether government intervention improves allocative efficiency. OR ● A good and thorough explanation of how government intervention may OR may not lead to improvement in allocative efficiency	5-7
L1	● Mere stating of definitions with little or no explanation ● Answers contain conceptual errors	1-4
E3	Makes well-explained substantiated judgement on whether government intervention is **more likely to improve allocative efficiency** by considering the context (health screening services market in Singapore), different factors that affect the likelihood to which policies will improve efficiency e.g. accuracy of information available etc.	5
E2	Attempts to substantiate whether government intervention will lead to **improvements in allocative efficiency.** Note: If comments focus on limitations or strengths of **policies** and did not make explicit links to whether government intervention will improve efficiency – max E2.	3-4
E1	Unsubstantiated judgement of the extent to which government intervention will lead to improvements in allocative efficiency.	1-2

Markers' comments

Content:

Subsidies

- Many students **wrongly** associated subsidies with an increase in the demand. Instead, subsidies, usually production subsidies, result in an increase in supply. This is because they are given to producers which affect their willingness and ability to sell the services. On the other hand, vouchers and grants given to households directly will result in an increase in the demand.

- There is room for improvement in giving adequate explanation of how the measures work. Mere stating what is seen on the graph is not enough. For example, in explaining the workings of a production subsidy, there is a need to explain the impact of the subsidy on the MPC of the firms followed by the subsequent impact on the market price and how the lowered price incentivises consumers to increase their quantity demanded.

- Since the question was on whether government intervention would result in a more allocative efficient outcome, students that explained under-subsidisation of health screening services (due to government having imperfect information to estimate MEB at Q*) should position it under the 'thesis', as there would still be an improvement in allocative efficiency.

Public Education

- Many students gave a descriptive analysis of public education such as “making them realise the true benefits of health screening and consume more” without explaining how it closes the information gap which increases the perceived MPB curve closer to the true MPB curve, thus increasing the demand and subsequently quantity consumed.

Free Provision

- Some students were not able to identify the new quantity consumed accurately on the diagram. Many thought the new quantity occurs where the MSB curve cuts the x-axis. This is **incorrect.** Some students just arbitrarily picked a quantity because the DD curve did not extend all the way to the x-axis. The correct quantity should occur where the DD=MPB curve cuts the x-axis. Identifying the wrong quantity would have also affected the accuracy of the analysis since the area of welfare loss due to free provision would also have been wrong.

Skill:

- Question dissection could be improved. Many students answered this question as an ‘appropriate’ question instead of ‘effectiveness’. Hence points on unintended consequences or constraints of the interventions, would not have scored E marks for them because they are not relevant to this question. Since the question is asking if intervention or non-intervention would result in a more (allocative) efficient outcome, students’ evaluation must be focused on the likelihood of improving allocative efficiency only. That being said, sometimes students can angle these points to address the question directly. For example, students who mentioned high opportunity costs of the interventions can link to Singapore having a healthy budget which means it has the ability to sustain the policy and improve allocative efficiency for an extended period of time, not just in the current time period. LEARNING POINT: Students need to dissect the question more thoroughly and learn how to draw links between the theoretical evaluation points and requirements of the question.

- Students who considered subsidy (for both perfect and imperfect information case) and free provision by the government failed to realise that the criticism of the latter is similar to the point on over-subsidy due to lack of perfect information. This means that students would not have earned that many more marks with their point on lack of perfect information. LEARNING POINT: Choose contrasting measures to have better scope for critique of the measures.

- Many students brought in inequity as an anti-thesis point. This is not relevant as the question specifically asks for (allocative) “efficient” outcomes.

- There is a tendency for sweeping statements to be made. For example, the point about how the government does not have accurate information thus resulting in a less efficient outcome was made without an illustration.

3. The tariff war between US and China, two of Singapore's largest export destinations, has lasted more than a year. As a result, Singapore's export-reliant economy has been negatively impacted and business sentiment has taken a hit.

Adapted from CNBC, 2 September 201

(a) Explain reasons for changes in the aggregate demand and supply of a country. [10]

(b) Discuss whether a decrease in investment expenditure will have a more significant impact than a decrease in export revenue on economic growth in Singapore. [15]

Answer Outline – Part (a)

R1: Explain reasons for changes in the AD of a country. **R2**: Explain reasons for changes in the AS of a country.

Introduction

- Aggregate demand curve shows the planned total value of domestically produced goods and services that buyers collectively desire to purchase at different general price levels (GPL) in a given time period.
    - It is obtained by summing planned consumption expenditure (C), investment expenditure (I), government expenditure (G) and net exports expenditure on goods and services (X - M).
    - A change in AD occurs if, *for any given price level*, there is a change in factors affecting one or more of its components (i.e. C, I, G or X−M).
- The aggregate supply (AS) curve shows the level of domestic output that firms collectively desire to produce at different general price levels.
    - The horizontal and intermediate ranges are based on the per unit production cost of all firms in the country.
    - The vertical range is based on Y_f which denotes full-employment or potential GDP - the maximum possible output that a country can produce by fully utilising all its available resources.
    - A change in AS occurs when there is a change in non-price determinants of supply.

Body

- Explain **2** reasons causing change in AD (Choose 2 factors that preferably affects X and I as they are mentioned in preamble and helpful for part b. But factors impacting C or G or M (households switching from Cd to M or vice versa) would also acceptable)

[P] A change in investment expenditure because of a change in expected rate of returns will lead to a change in AD. [E,E] Firms weigh marginal cost of investing (i.e. interest rate) against marginal benefits i.e. expected rate of returns when making investment decisions. When firms expect a slowdown in economic growth or recession, they would expect lower rate of returns on their investment projects. Holding interest rate constant, this would lead to some investment projects becoming unprofitable, as the lower expected rate of returns will now be lower than interest rate. Firms will thus invest less and buy less capital. [L] Investment expenditure will decrease leading to a fall in AD.

[P] A change in export revenue will also change AD. [E, E] A country's export revenue depends on the income level of foreigners. A decrease in foreign income, ceteris paribus, will lead to a fall in their purchasing power and hence a decrease in demand for imported goods and services by foreign

countries, i.e. decrease in this economy's exports causing a fall in AD, as represented by a leftward shift of the AD curve. [L] Hence, a fall in export revenue from a fall in foreign income levels, will lead to AD falling.

- Explain **2** reasons causing change in AS (1 point for change in UCOP, 1 point for change in productive capacity- i.e. change in quality OR quantity of FOP)

[P] A change in price of factor inputs will affect the horizontal portion of the AS. [E, E] Increases in prices of either key domestic or imported inputs like crude oil or other raw materials will drive up the firms' unit cost of production, causing AS to fall i.e. horizontal portion of AS curve shifts upwards. [L] Hence, the rise in price of factor input will lead to AS falling in the short term.

[P] A change in quantity or quality of the country's resource will affect the vertical portion of the AS. [E,E] For example, an increase in the educational levels and training in an economy due to an increase in investment in human capital will increase the skills of its people i.e. quality of labour increases. With a higher labour productivity, each unit of labour can now produce more output than before. This will increase the economy's ability to produce more goods and services, even if quantity of FOP remains unchanged. Ceteris paribus, this will increase productive capacity and increase AS, shifting AS to the right. [L] Hence, an increase in quality of FOP will increase AS in the long term.

Conclusion
Hence, there will be a change in AD when there is a change in any of the AD components, and a change in AS when there is a change in unit cost of production or productive capacity of economy.

Mark Scheme

Levels	**Descriptors**	**Marks**
L3	● Well-developed explanation of factors affecting AD and AS. ● Provides relevant examples / scenarios in explanation.	8 - 10
L2	Under-developed explanation of at least 2 factors that affect AD and/or AS.	5 – 7
L1	● Shows some knowledge of factors affecting AD and/or AS. ● Mere listing with little explanation of the factors that affects AD and/or AS. ● Serious conceptual errors are present and affect analysis.	1 - 4

Markers' comments

Content:

- Students should not be explaining the components of AD (C, I, G, X-M) but the factors that affect the components.

- Application of the marginalist principle about how firms compare the expected rate of return against the interest rate in their investment decisions was required for a complete explanation of the factors 'expected rate of return of investment' or 'interest rate'.

- Students who brought in improvement in labour productivity lowering the unit cost of production (UCOP) for firms often missed out the assumption that wage rate remains unchanged. This is an important assumption as UCOP might not fall if each unit of labour is compensated higher wages for their improved labour productivity. While such answers are not wrong, they are incomplete, which limits the rigour of the analysis.

- Many students remembered that labour productivity can impact both the horizontal and vertical portion of the AS curve but were unable to make a distinction in their explanation between the two impacts. Many scripts wrote that since UCOP has fallen, vertical AS falls and shifts leftwards. This is incorrect as a fall in UCOP affects horizontal AS (downward shift) and not vertical AS. The accurate analysis for vertical AS is an improvement in productive capacity due to a rise in the quality of labour.

Skill:

- The question is asking for causes (reasons) of a change in AD but some students mistook it for consequences of a change in AD (process), and went on to explain the factors that were changing in the preamble before bringing in the multiplier process. Such explanation was irrelevant to the question.

- Students need to be more careful in question dissection and interpretation. In such open questions, students are free to select points to answer the question without the need to refer to the preamble.

- Given time constraints, students should pick the most rigorous factors to explain for a good L mark, for example, a change in interest rate to explain the impact on AD. They should avoid factors like a change in exchange rate (or the effect of the China-US trade war on Singapore's exports as in the preamble) which they have not learnt fully, and run the risk of making mistakes in the explanation.

- Many students wrote a lot (e.g. a point each for factors affecting C, I, G and X-M). These answers tend to be descriptive and lack depth even though they cover breadth. For example, students who brought in changes in interest rate do not make use of the marginalist principle to effect a change in I. Another common example is the expectations of future prices or income. Students who brought this point in (expect future prices or income to rise) were able to talk about how willingness to consume goods and services have gone up but quite often missed out 'thus households consume more in the current time period'. This is the important angle that should be included in the analysis to explain a change in C in the current time period and not in the future.

Answer Outline – Part (b)

R1: Explain impact of decrease in X on EG in Singapore. **R2**: Explain impact of decrease in I on EG in Singapore. Ev: Weigh and assess with economic reasoning – which has a greater impact on EG in Singapore, X or I?

Introduction

Sustained economic growth involves both actual and potential growth. Actual economic growth is the increase in real national output. Potential growth is the increase in the capacity (potential) of the economy to produce.

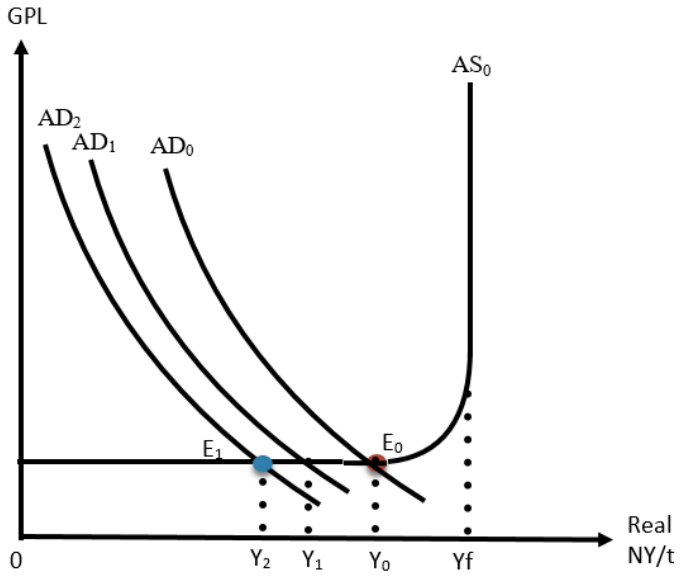
To determine whether decrease in I or X has a greater impact on economic growth, we need to consider their impact on Singapore's actual and potential growth.

Body

Thesis: A fall in export revenue has a significant impact on EG.

- [P] With the background of economic instability around the rest of the world e.g. China and US, it will cause our X to fall. [E, E] With the poor economic outlook due to the trade tensions, foreign consumers will hold back on consumption, including that of imported goods, due to expectations of a fall in their future income.

- A fall in X will decrease AD, leading to a multiplied fall in real national income via the multiplier effect. There will thus be negative actual growth. Assuming prices are constant and there is spare capacity, a fall in AD from AD_0 to AD_1 due to a decrease in autonomous spending leads to an unplanned accumulation of inventories for firms. Firms will decrease their production and hire less factors of production such as labour, and national output decreases from Y_0 to Y_1. Household income falls, causing households to cut back on consumption of domestically produced goods and services, save less, pay less taxes and buy less imports. Withdrawals will thus also fall. With the fall in consumption, firms that produce these goods will in turn reduce their production and income will fall again, through the multiplier process. This process of decrease in consumption of domestic goods/services and decrease in output and income will continue until total withdrawals (W) equal total injections (J) again and a new equilibrium national income is achieved. [L] This leads to national income falling by multiples depending on the multiplier size. Hence, it leads to negative actual growth where real NY falls from Y_0 to Y_2.



- [Ev] The fall in X impacts Singapore greatly because X as a proportion of Singapore's GDP is big. Since Singapore is an open economy, with the value of exports approximately 176% of its GDP (or 1.7 times of GDP), a decrease in demand for its exports will result in a large extent of fall in the AD. Ceteris paribus, this will cause real GDP to decrease by a large extent. Therefore, the fall in actual growth is significant, even if our multiplier size is small (due to high MPW).

Anti-thesis: A fall in investment expenditure may also have a significant impact on EG.

- [P] A fall in I will decrease not just the AD with similar effects to that of the fall in X as explained above, but also affect AS, leading to a negative impact on sustained growth (which requires both actual and potential growth). [E, E] Assuming that the rate of capital depreciation is less than the investment rate, the fall in I will result in Singapore's capital stock increasing more slowly. Productive capacity thus increases at a slower rate, causing AS to increase marginally and the vertical portion of AS to only shift out slightly. Fall in I will also hinder the increase in productivity of factor inputs (e.g. labour), similarly leading to a slower increase in productive capacity. [L] Hence a fall in I will likely cause a fall in AD and slow down the increase in AS for Singapore, negatively impacting both actual and potential growth.

- [Ev] Although the total amount of investments would seem relatively small in Singapore, investments are of vital importance to the economy as they provide the necessary capital required to produce the domestic goods that generate a national income. Furthermore, as a small country lacking in certain resources, Foreign Direct Investments (FDIs) play a crucial role in providing the expertise and capital needed for increased production. As such, a fall in I would have a significant impact on potential growth.

<u>Conclusion</u>

[Stand]

In the case of Singapore, a decrease in X will have a more significant impact than a decrease in I on economic growth, especially in the short run.

[Substantiation]

As X as a % of GDP is far larger than I in Singapore, a decrease in X will lead to a much larger impact on AD and thus decrease real GDP to a larger extent. This is because the size of Singapore's domestic market is small, owing to our small population size relative to the rest of the world. As such, Singapore is very open as an economy, and relies on trade with the bigger global market for economic growth.

However, with regards to potential growth, the decrease in I will have a far more significant impact. In situations where Singapore is operating close to full employment level of output (Y_f), which is usually the case for Singapore, potential growth can be very important in allowing actual growth to continue in Singapore. Without increases in productive capacity, real GDP cannot increase beyond Yf, limiting economic growth. Thus, in the long run, the fall in I would have a more significant impact on economic growth.

In situations such as the current context where Singapore is experiencing a recession, the fall in X will still lead to a more significant impact on economic growth, since Singapore is not operating near full employment level of output. Potential growth is thus of a lower priority now as real output can still increase in the event of AD rising.

Mark Scheme

Levels	Descriptors	Marks
L3	Well-developed and balanced explanation on how X **and** I will affect actual **and** potential growth. Explanation of the impact on NY includes the multiplier effect.	8 - 10
L2	Descriptive explanation of the effect of a fall in X **and** fall in I on actual **and** potential EG. (e.g. explains how AD affects NY but demonstrates limited understanding of multiplier effect) OR Under-developed analytical explanation of the effect of a fall in X **or** I on actual **and** potential growth. OR Under-developed analytical explanation of the effect of a fall in X **and** I on actual **or** potential growth.	5 - 7
L1	Some knowledge of economic growth or impact of fall in X and I on national income but not addressing the question.	1 - 4
E3	Provides a well-substantiated analytical evaluation of whether a fall in X or I is more significant in affecting EG **in Singapore**. Contextual examples are used to support claims.	5
E2	Some attempt at judgement and elaboration of whether a fall in X or I is more significant in affecting EG in Singapore.	3 – 4
E1	Makes unsupported statement about whether a fall in X or I is more significant in affecting EG in Singapore.	1 – 2

Markers' comments

Content:

- Students need to get their expressions right.
  Learning points: 1. A fall in equilibrium national output (Ye) is described as not just a fall in actual growth but should be described as 'negative actual growth'. 2. A slowing of the rate of increase in potential national output (Yf) is described as a fall in potential growth while if Yf is falling, then it should be described as 'negative potential growth'.

- Many students wrongly used Singapore having no natural resources as a point for evaluation to say that Singapore is reliant on exports. However, that will affect M and not X. Students should instead explain that Singapore has a small domestic market and hence is required to trade with the rest of the world which provides a much bigger market for the goods Singapore produces.

- There were several points commonly brought in by students which were irrelevant. Firstly, the explanation of Singapore's multiplier size is irrelevant, because a fall in X and I will both result in a downward multiplier effect. Secondly, explanation of the impact of trade war between USA and China and the impact on Singapore's X and I is also irrelevant.

- To determine if a fall in X and/or I will lead to a significant fall in AD, students should focus on their relative % of Singapore's GDP. Since X takes up a large % of Singapore's GDP, the initial fall in AD will be large, causing a significant fall in real GDP and hence significantly impact Singapore's economic growth.

- In the downward multiplier process, some students wrote that a fall in national income will cause consumers to change their MPC and MPS, which is **incorrect**. In the same vein, some students also wrongly say that with falling income, consumers will now consume less and save more. The correct explanation should be that with falling income, consumers will consume less domestically produced goods and services, save less, as well as pay less taxes and spend less on imported goods and services.

- Many students stopped their explanation of the multiplier effect at the change in AD without linking to the impact on national income/GDP, and also did not further link back to actual growth.

- Many students did not link a fall in I to negative or slowing potential growth, limiting the scope of discussion for this question. For students who did manage to make the link, most did not draw out the important evaluation, which is how it limits Singapore's ability to achieve sustained economic growth because it tends to be operating near full employment level.

- A handful of students wrote that X will affect AD and I will affect AS, without recognising that I will also affect AD.

- Inappropriate use of the word 'productivity' was often seen. Learning points: 1. Productivity is not the same as productive capacity even though the former impact the latter. 2. Productivity is not the same as the national product. 3. The word productivity is to be used with a factor of production because it refers to the output obtained from one unit of a factor of production. Thus, it makes economic sense to say 'factor productivity' or 'labour productivity' but 'firm productivity' is inappropriate.

Skill:

- Many students drew repeated diagrams to explain the impact on X and I when they can just use 1 diagram.

- A lot of students mistakenly focused their answer on evaluating which has a more significant impact without bringing in the theoretical analysis of how a fall in I and X may affect AD and AS, thus affecting economic growth performance. Students need to be very conscious of the mark allocation and think what goes to L marks and E marks before writing their answer.

- There is no need to provide both the circular flow of income model and the AD-AS model to describe the downward multiplier process. 1 model would suffice. If a question does not specify the use of the circular flow of income model, then you should use the AD-AS model. For this question, AD-AS model is preferred because the circular flow of income model does not provide the scope to analyse the impact of a change in investment expenditure on *potential* national output.

- Conclusion is sometimes repetitive (similar to the points in the body). Students could bring in the current situation as an example and evaluate further rather than give a stock evaluation.