

Candidate Name: \_\_\_\_\_

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## 2019 End-of-Year Exams Pre-university 2

**H1 ECONOMICS****8823/01**

Paper 1

**16 September 2019****3 hours**

Additional Materials: Answer Paper

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### READ THESE INSTRUCTIONS FIRST

Write your name and class on all the work you hand in.  
Write in dark blue or black pen on both sides of the paper.  
You may use a soft pencil for any diagrams or graphs.  
Do not use staples, paper clips, highlighters, glue or correction fluid.

Answer **all** questions.

At the end of the examination, fasten your work to Questions 1 and 2 **separately**.  
The number of marks is given in brackets [ ] at the end of each question or part question.

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This question paper consists of **8** printed pages.

**[Turn over**

Answer **all** questions.

### Question 1: A Meaty Muddle

**Table 1: Global meat consumption (1961 and 2013)**

	1961	2013
Meat consumption per capita (kg)	23.08	43.22
Population (billions)	3.07	7.21

Source: Various, 2017 and 2019

#### **Extract 1: Rising global meat consumption 'will devastate environment'**

Rising global meat consumption is likely to have a devastating environmental impact, scientists have warned.

A new major analysis suggests meat consumption is set to climb steeply as the world population increases along with average individual income, and could play a significant role in increasing carbon emissions and reducing biodiversity.

“What’s happening is a big concern and if meat consumption goes up further it’s going to be massively more so,” said Prof Tim Key, an epidemiologist at the University of Oxford and co-author of the review. “On a broad level you can say that eating substantial amounts of meat is bad for the environment.”

The review, published in the journal, *Science*, found that high levels of meat consumption also have negative health consequences, leading to an increased risk of colorectal cancer and possibly of cardiovascular disease.

The average amount of meat consumed per person globally has nearly doubled in the past 50 years, from around 23kg in 1961 to 43kg in 2014. The increase in average individual meat consumption means total meat production has been growing at a much faster than the rate of population growth, increasing four or fivefold since 1961.

There are recent indications that some countries, including the UK, may have reached “peak meat”. The UK’s 2017 National Food Survey found consumption of raw beef, lamb and pork had fallen by 4.2% and that of meat products including sausages, bacon and poultry by nearly 7% since 2012.

However, middle-income countries, particularly China and others in East Asia, are still seeing a rise. Taken together, there is a projected increase in global meat consumption of 76% by mid-century, including a doubling in the consumption of poultry, a 69% increase in beef and a 42% increase in pork.

“It is difficult to envisage how the world could supply a population of 10 billion or more people with the quantity of meat currently consumed in most high-income countries without substantial negative effects on the environment,” the *Science* paper concludes.

The paper outlines how, in broad terms, meat production – particularly livestock – is linked to far higher carbon emissions than vegetables, fruits and grains. Livestock production currently accounts for 15% of all anthropogenic emissions (carbon dioxide, methane and nitrous oxide).

Livestock farming is also a major contributor to biodiversity loss, as forests and wild countryside are given over to agricultural land to grow animal feed. And the draining of rivers

and lakes to irrigate land used to grow corn and other grains used as animal feed is already having a substantial impact on water resources, the analysis found.

The paper also flags the potential negative health consequences of adopting a meat-heavy diet, although these are moderate compared to other ills like smoking. Since 2015, processed meat has been ranked by the World Health Organization in a group of 120 proven carcinogens alongside alcohol, asbestos and tobacco. According to Cancer Research UK, if no one ate processed or red meat in Britain, there would be 8,800 fewer cases of cancer a year.

Source: The Guardian, 2018

### **Extract 2: \$68m fund to turn labs into food factories of the future**

A total of US\$50 million (S\$68 million) is up for grabs here for those who can produce proteins of the future, such as lab-grown meat<sup>1</sup>.

In the coming years, food production will struggle to keep up with more hungry mouths, who will need about 60 per cent more food by 2050. And already, global warming is threatening yields from the land and sea.

To deal with the impending food shortage, Singapore is concentrating efforts on increasing the nation's food output, with the ambitious goal of producing 30 per cent of what people need to eat by 2030, from less than a tenth now. Lab-grown meat will be a key industry to develop.

Additionally, lab-grown meat has a lower carbon footprint than conventional meat and do not involve killing animals. If successful, lab-grown meat will also minimise climate change.

To support this effort, the Government has pledged funding of up to \$144 million for food-related research and development programmes, as well as \$80 million into cell manufacturing, which will be a cornerstone of lab-grown meat. It is also opening up an experimental farming plot in Sungei Kadut to test out ideas, and ramping up related courses.

<sup>1</sup>Lab-grown meat refers to meat that is grown from cells cultured in laboratories. This is in contrast to conventional meat where a live animal has to be reared before it is killed to produce the meat.

Source: The Straits Times, 2019

### **Extract 3: Add more plants, and less meat to your meals. Here's why**

In recent years, more people have been adding more plants to their plate in place of meat. The growing awareness of the role of animal agriculture (using animals for meat, eggs and dairy) as a leading driver of global warming is part of the reason.

However, as important as environment and animal welfare issues are, health may be the primary motivation driving this shift towards plant-based foods.

Research demonstrates how eating plants can boost our health by raising antioxidant levels, lowering weight and cholesterol, and reducing risk of chronic diseases, such as diabetes, heart disease, certain cancers and dementia. And campaigns such as the global "Meatless Monday" movement have seized the opportunity to encourage consumers to eat less meat through publicising such information. They encourage consumers to reduce meat consumption by not eating meat on Mondays.

Source: Various, 2018 and 2019

**[Turn over**

**Questions**

- (a) (i) Calculate the total global meat consumption in 1961 and in 2013, and describe how it has changed. [3]
- (ii) Compare the change in global meat consumption per capita and the change in the global population. Hence, infer which contributed more to the change in total global meat consumption described in (a)(i). [3]
- (iii) From Extract 1, identify and explain the reasons for the change in total global meat consumption. Illustrate your answer with an appropriate diagram. [4]
- (b) Using Extract 1, explain the concepts of market failure due to negative externalities and imperfect information in the context of the meat market. [8]
- (c) Assess how well each of the following addresses the failure in the meat market.
- (i) The Singapore government pledging “\$80 million into cell manufacturing, which will be a cornerstone of lab-grown meat” (Extract 2). [8]
- (ii) “Campaigns such as the global “Meatless Monday” movement” (Extract 3). [8]
- (d) In view of the world having “more hungry mouths” and that “global warming is threatening yields” (Extract 2), discuss how the conventional meat industry would be affected by the development of lab-based meat and campaigns like the “Meatless Monday” movement. [11]

**[Total: 45 marks]**

## Question 2: Currency Manipulation and the Economy

### Extract 4: What is currency manipulation?

Currency manipulation occurs when a country manipulates the rate of exchange between their currency and another (for example, the US dollar) to gain a competitive advantage. As set out in the Treasury report, one of the US administration's aims is to combat "unfair" currency practices that "facilitate competitive advantage, such as unwarranted intervention in currency markets".

The Monetary Authority of Singapore (MAS) said that it "does not manipulate its currency for export advantage". Singapore conducts monetary policy not by targeting interest rates, but by managing the Singapore dollar nominal effective exchange rate (S\$NEER) within a policy band, it said. As part of this, MAS may intervene in the foreign exchange market to prevent excessive fluctuations in the Singapore dollar exchange rate. "Intervention in the foreign exchange market is expected to manage the SGD within the S\$NEER band," said Ms Ling. But MAS does not and cannot use the exchange rate to gain an export advantage or achieve a current account surplus, the central bank said. This is because a deliberate weakening of the Singapore dollar would cause inflation to spike and compromise MAS' price stability objective, it added.

Adapted from: Channel NewsAsia, 29 May 2019

### Extract 5: Are trade wars spiralling into currency wars?

The recent weakening of the Chinese Renminbi (RMB) to its lowest level in over fifteen months against the US dollar has fuelled speculations that China is intentionally devaluing the RMB to counter the impact of rising US tariffs. An RMB depreciation may likely offset some of the tariff impacts but there are worries that it could create a "domino" effect with other countries following suit. Indeed, President Trump tweeted about his belief that currency manipulation was pervasive across the rest of the world, taking away the competitive edge of the US. However, it is far from clear as to whether the RMB depreciation can be deemed deliberate. The weakening could well be in part due to a hike in US interest rates, which increased demand for its currency.

If a series of depreciations were to occur in the region, it could likely destabilise countries in Asia both due to imported inflation and the relatively high levels of US dollar denominated corporate debt accumulated by many Asian firms. The worst scenario being that if a currency war turns into a currency freefall in Asia, interest rates will need to rise to stabilise the currencies, leading to significant economic slowdown.

Adapted from: Lee Kuan Yew School of Public Policy, 21 August 2018

**[Turn over**

**Table 2: Macroeconomic Indicators, 2018**

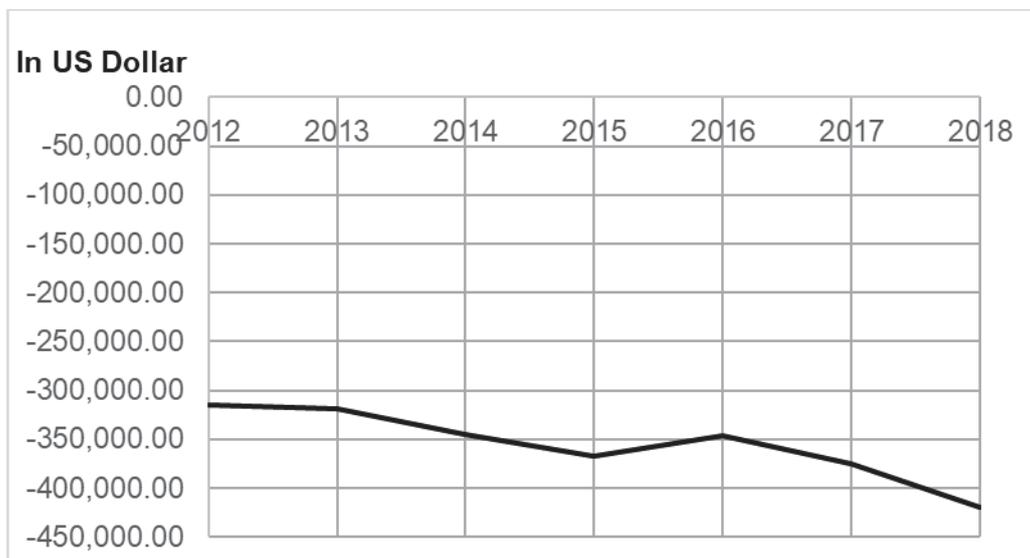
	China	USA	Singapore
Real GDP growth (annual %)	6.6	2.9	3.1
Inflation (annual %)	2.9	2.3	1.9
Population Growth (annual %)	0.5	0.6	0.5
Overall Unemployment (annual average %)	3.9	3.9	2.1

Source: World Bank, Ministry of Manpower, Singapore and Trading Economics. Accessed: July 2019

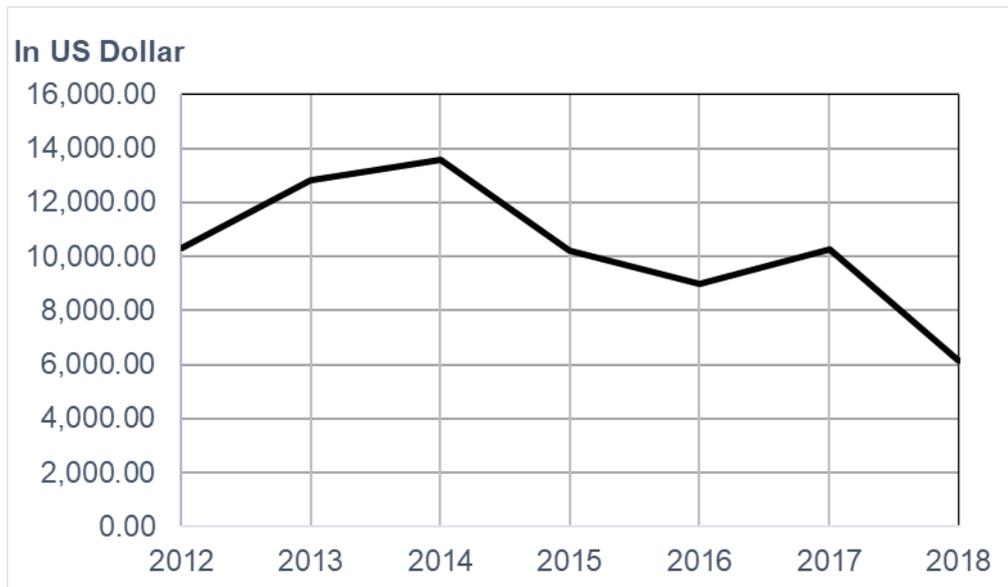
**Table 3: Human Development Index**

	2014	2015	2016	2017
China	0.738	0.743	0.748	0.752
USA	0.918	0.920	0.922	0.924
Singapore	0.928	0.929	0.930	0.932

Source: United Nations Development Programme, Human Development Report. Accessed: August 2019

**Figure 1: United States' Trade Balance in Goods with China**

Source: United States Census Bureau. Accessed: July 2019

**Figure 2: United States' Trade Balance in Goods with Singapore**

Source: United States Census Bureau. Accessed: July, 2019

#### **Extract 6: Federal Reserve raises interest rates again**

US interest rates remain relatively low, reflecting the Federal Reserve's decision to lower them dramatically during the financial crisis in an effort to encourage borrowing and boost economic activity. But Federal Reserve (Fed) Chair Jerome Powell and other economists say today's economy is strong enough that such stimulus is no longer necessary. Mr. Powell said Wednesday's rate rise reflected the Fed's confidence in the US economy. But he acknowledged that the bank is hearing a "rising chorus of concerns" from businesses about the risk from new US trade tariffs, which have disrupted supply chains and led to retaliation against US exports.

Higher interest rates make borrowing more expensive, slowing economic activity and curbing price inflation. There have already been slowdowns some sectors in the US, such as home and car sales, where higher interest rates have led some price-conscious consumers to pull back. Analysts worry that raising rates too quickly could tip the economy into recession.

Adapted from: BBC News, 26 September 2018

#### **Extract 7: Monetary Authority of Singapore, Macroeconomic Review, April 2019**

The growth momentum of the global economy has moderated by more than expected at the turn of the year alongside sluggish trade. As a result, the Singapore economy has slowed, and is likely to expand at a modest pace in the coming quarters. Over the last six months, the contribution of the manufacturing sector to GDP growth has waned, reflecting the maturing of the global electronics cycle and the economic slowdown in China. Meanwhile, activity in the services sector stayed firm, supported mainly by financial and business services, as well as information and communication services. The construction sector has also recovered from a protracted period of weakness.

**[Turn over**

In 2019, external sources of inflation are likely to be benign, as global oil prices are expected to come in lower for the year as a whole than in 2018, while food prices should only pick up slightly on average. On the domestic front, labour market conditions remain firm and will support moderate wage increases, such that unit labour costs should continue to rise. However, an acceleration in inflationary pressures is unlikely against the backdrop of slower GDP growth, uncertainties in the global economy, as well as the continuing restraining effects of MAS' monetary policy tightening in 2018.

Adapted from: Monetary Authority of Singapore, April 2019

### Questions

- (a) Identify which country has the highest nominal GDP growth in 2018 and support your answer with a calculation. **[2]**
- (b) (i) Compare the trend of United States Trade Balance in goods with China with that of Singapore. **[2]**
- (ii) With reference to Extract 5 and Figure 1, explain whether the data shows that China is manipulating its currency. **[4]**
- (c) Explain the positive impacts of Federal Reserve's decision to raise interest rates on the US economy and comment on its appropriateness. **[7]**
- (d) (i) Identify which country has the largest change in real GDP per capita in 2018 and support your answer with a calculation. **[2]**
- (ii) Using Tables 2 and 3, assess whether China, USA or Singapore has the greatest improvement in standard of living. **[8]**
- (e) (i) Explain why "Singapore conducts monetary policy not by targeting interest rates, but by managing the Singapore dollar nominal effective exchange rate (S\$NEER)" (Extract 4). **[8]**
- (ii) In light of the current economic outlook, assess whether Singapore should change its policy stance of "monetary policy tightening" (Extract 7). **[12]**

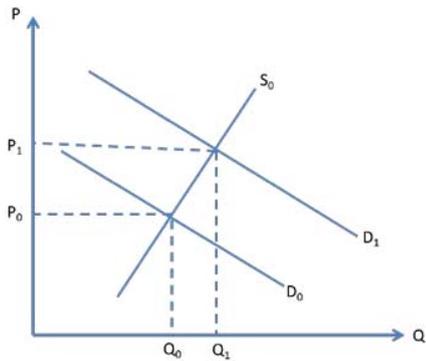
**[Total: 45 marks]**

**- End of Paper -**



Question 1

(a)	(i)	<p><b>Calculate the total global meat consumption in 1961 and in 2013, and describe how it has changed.</b></p>	[3]
		<p>Total global meat consumption = Meat consumption per capita x Global Population            For 1961: 23.08kg x 3.07 billion = 70.86 billion kg [1]            For 2013: 43.22kg x 7.21 billion = 311.62 billion kg [1]</p> <p>Overall, total global meat consumption has increased. [1]</p> <p><i>1m for accurate calculation of total global meat consumption in 1961            1m for accurate calculation of total global meat consumption in 2013            1m for identifying the increase</i></p> <p><i>Note: For the first 2m, if the student shows the correct formula but makes a calculation error, award 1m</i></p>	
	(ii)	<p><b>Compare the change in global meat consumption per capita and the change in the global population. Hence, infer which contributed more to the change in total global meat consumption described in (a)(i).</b></p>	[3]
		<p>Both global meat consumption per capita and global population increased. [1]            However, the increase in global population was to a greater extent. [1]            Hence, the increase in the global population contributed more to the increase in the total global meat production. [1]</p> <p><i>1m for comparison of general trend            1m for comparison of extent of change            1m for accurate inference of which contributed more to the increase in the total meat production</i></p> <p><i>Note: Allow for error carried forward</i></p>	
	(iii)	<p><b>From Extract 1, identify and explain the reasons for the change in total global meat consumption. Illustrate your answer with an appropriate diagram.</b></p>	[4]
		<p>The two reasons are the increase in the global population [1], and the increase in average incomes [1] (Extract 1: “suggests meat consumption is set to climb steeply as the world population increases along with average individual income”).</p> <p>Both the increase in global population and the increase in average incomes would cause the demand for meat to increase [1].</p>	



As can be seen in the diagram above, the increase in demand caused the consumption of meat to increase from  $Q_0$  to  $Q_1$  units. [1]

1m for each reason identified from Extract 1 that is linked to an increase in demand (up to 2m)  
 1m for explanation using D&S analysis (i.e., increase in  $D$  causing increase in  $Q$ )  
 1m for diagram with reference to the diagram

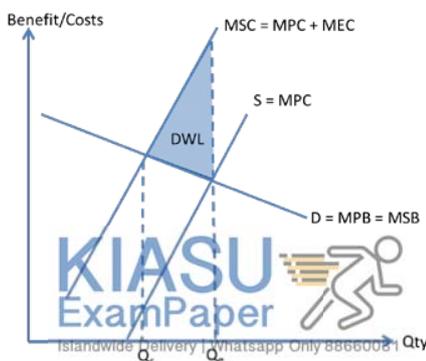
**(b) Using Extract 1, explain the concepts of market failure due to negative externalities and imperfect information in the context of the meat market. [8]**

The market for meat is failing due to both negative externalities and imperfect information.

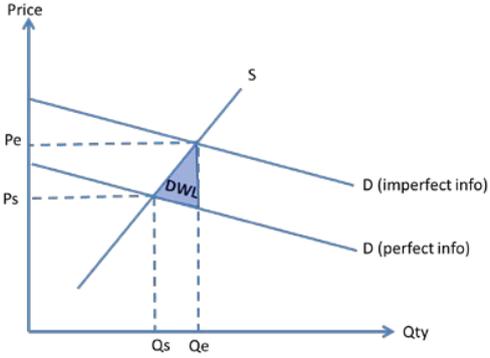
Explain how market fails due to negative externalities

Meat production generates negative externalities in terms of the damage to the environment such as the loss of biodiversity due to the clearing of land for livestock farming, and the contribution to global warming (Extract 1).

Such negative externalities cause a divergence between marginal social cost (MSC) and marginal private cost (MPC) as  $MSC = MPC + \text{marginal external cost (MEC)}$ .



In the diagram above, the market equilibrium would be at  $Q_e$  where  $MPB = MPC$  as consumers and producers of meat are self-interested and do not consider external costs. However, the socially optimal output is at  $Q_s$  where  $MSB = MSC$ . Since  $Q_e$  exceeds  $Q_s$ , there is overproduction of meat. This

	<p>causes a deadweight loss of the shaded area as MSC exceeds MSB for the output between <math>Q_s</math> and <math>Q_e</math>.</p> <p><u>Explain how market fails due to imperfect information</u></p> <p>Moreover, the market may fail due to imperfect information where consumers underestimate the cost of consuming meat to themselves, such as the health cost in terms of increased risk of colorectal cancer and possibly of cardiovascular disease (Extract 1).</p> <p>This causes the demand with imperfect information to be higher than the demand with perfect information, as seen in the diagram below.</p>  <p>The market equilibrium would be at <math>Q_e</math> where <math>D_{\text{imperfect}} = S</math>. However, the socially optimal output is at <math>Q_s</math> where <math>D_{\text{perfect}} = S</math>. Since <math>Q_e</math> exceeds <math>Q_s</math>, there is overconsumption of meat. This causes a deadweight loss of the shaded area.</p> <p><i>4m for each source of market failure explained</i></p> <ul style="list-style-type: none"> <li>• 1m for explaining the source of market failure in the context of Extract 1</li> <li>• 1m for explaining <math>Q_e</math> (provision of the condition)</li> <li>• 1m for explaining <math>Q_s</math> (provision of the condition)</li> <li>• 1m for overproduction/overconsumption and hence DWL</li> </ul>	
(c)	<p><b>Assess how well each of the following addresses the failure in the meat market.</b></p>	
(i)	<p><b>The Singapore government pledging “\$80 million into cell manufacturing, which will be a cornerstone of lab-grown meat” (Extract 2).</b></p>	[8]
	<p>Question Analysis</p> <p>Command word = “Assess” → Need two sides and an evaluative conclusion</p> <p>Content = “how well the Singapore government pledging “\$80 million into cell manufacturing, which will be a cornerstone of lab-grown meat” addresses the failure in the meat market” → Two sides are:</p> <ul style="list-style-type: none"> <li>• Singapore government pledging “\$80 million into cell manufacturing...” addresses the failure in the meat market</li> <li>• Singapore government pledging “\$80 million into cell manufacturing...”</li> </ul>	

does not address the failure in the meat market (i.e., limitations of the policy)  
Context = Singapore, meat market

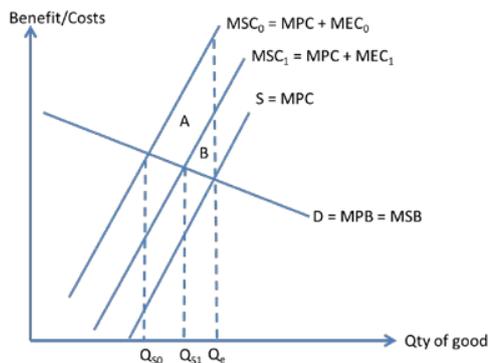
Introduction

The Singapore government pledging “\$80 million into cell manufacturing...” is an example of an R&D grant. This R&D grant could help solve the market failure due to negative externalities in the meat industry.

Thesis: Singapore government pledging “\$80 million into cell manufacturing...” addresses the failure in the meat market

The development of cell manufacturing would allow meat to be produced without having to raise livestock. This would mean that the production of meat would produce less negative externalities as there would not be any carbon emissions from livestock, and there would be no loss of biodiversity due to not having to clear land to raise livestock.

The reduction in negative externalities would mean that MEC decreases and hence MSC would shift towards MPC. As such, the gap between  $Q_s$  and  $Q_e$  would be reduced and so would the deadweight loss. This is seen in the diagram below where the shift of MSC from  $MSC_0$  to  $MSC_1$  eventually caused the DWL to fall from area A+B to just area B.



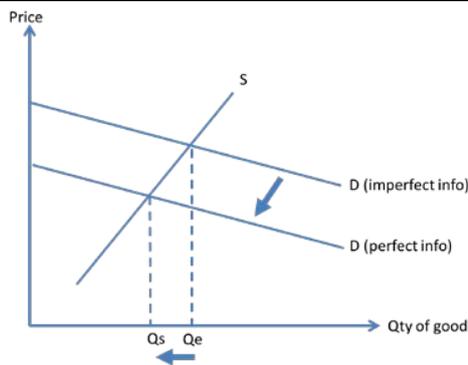
Anti-thesis: Singapore government pledging “\$80 million into cell manufacturing...” does not address the failure in the meat market (i.e., limitations of the policy)

However, there may be limitations to this policy. First, the development of lab-based meat is still in its infancy and the R&D efforts may not be successful (Extract 2: “If successful, ...”). Additionally, even eventually successful, the process may take a long time and is unable to address the pressing problem of climate change.

Conclusion

In conclusion, how well the policy of giving R&D grants addresses the market failure would depend on the time period in question. In the short run, it is unlikely that there would be any discernible effect. However, in the long run, assuming it is successful, it would address the market failure quite well since it allows for the negative externalities to be avoided without consumers having to

	<p>make lifestyle changes.</p> <table border="1"> <thead> <tr> <th>Level</th> <th>Descriptor</th> <th>Marks</th> </tr> </thead> <tbody> <tr> <td>2</td> <td> <p>Explains both thesis and anti-thesis (balance) and make use of appropriate economic analysis (depth). The context of the meat market is accounted for (i.e., not a purely theoretical answer) (context).</p> <p>Well-explained thesis only – Max 4 No context at all – Max 4</p> </td> <td>4-6</td> </tr> <tr> <td>1</td> <td>Answer lacks depth.</td> <td>1-3</td> </tr> <tr> <td>E</td> <td>Makes a judgement that answers the question, and justifies the judgement.</td> <td>1-2</td> </tr> </tbody> </table>	Level	Descriptor	Marks	2	<p>Explains both thesis and anti-thesis (balance) and make use of appropriate economic analysis (depth). The context of the meat market is accounted for (i.e., not a purely theoretical answer) (context).</p> <p>Well-explained thesis only – Max 4 No context at all – Max 4</p>	4-6	1	Answer lacks depth.	1-3	E	Makes a judgement that answers the question, and justifies the judgement.	1-2	
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E	Makes a judgement that answers the question, and justifies the judgement.	1-2												
(ii)	<p><b>“Campaigns such as the global “Meatless Monday” movement” (Extract 3).</b></p>	[8]												
	<p>Question Analysis</p> <p>Command word = “Assess” → Need two sides and an evaluative conclusion Content = “how well campaigns such as the global “Meatless Monday” movement addresses the failure in the meat market” → Two sides are:</p> <ul style="list-style-type: none"> <li>• campaigns such as the global “Meatless Monday” movement addresses the failure in the meat market</li> <li>• campaigns such as the global “Meatless Monday” movement does not addresses the failure in the meat market (i.e., limitations of the policy)</li> </ul> <p>Context = meat market</p> <p><u>Introduction</u> The “Meatless Monday” movement is an example of education and campaigns. It could help solve the market failure due to imperfect information in the meat industry.</p> <p><u>Thesis: Campaigns such as the global “Meatless Monday” movement addresses the failure in the meat market</u> Such campaigns help to inform consumers about the negative health effects of consuming too much meat and the positive health effects of replacing some of the meat with plants instead. This corrects the imperfect information of consumers.</p> <p>The correction of imperfect information would means that consumers would now demand less meat and demand would fall from Dimperfect to Dperfect in the diagram below. Hence, <math>Q_e</math> would fall to <math>Q_s</math>, correcting the market failure by removing the DWL.</p>													



Anti-thesis: Campaigns such as the global “Meatless Monday” movement does not addresses the failure in the meat market (i.e., limitations of the policy)

However, there may be limitations to this policy. First, the extent of the fall in demand may be limited if consumers find it difficult to change their eating habits. This is especially so in developing/middle income countries where eating meat is also a status symbol. Also, even if consumers mindsets can be changed eventually, it would take a long time and cannot address the pressing issue.

Conclusion

In conclusion, how well the policy of campaigns addresses the market failure would depend on the country in question. In countries such as UK where meat is no longer a status symbol, such a campaign is more likely to be successful (Extract 1: UK has reached peak meat). However, in countries such as China where in rural areas, the ability to afford meat is still a status symbol, it is less likely to be successful.

Level	Descriptor	Marks
2	Explains both thesis and anti-thesis (balance) and make use of appropriate economic analysis (depth). The context of the meat market is accounted for (i.e., not a purely theoretical answer) (context).  Well-explained thesis only – Max 4 No context at all – Max 4	4-6
1	Answer lacks depth.	1-3
E	Makes a judgement that answers the question, and justifies the judgement.	1-2

(d)

**In view of the world having “more hungry mouths” and that “global warming is threatening yields” (Extract 2), discuss how the conventional meat industry would be affected by the development of lab-based meat and campaigns like the “Meatless Monday” movement.**

[11]

Question Analysis

Command word = “Discuss” → Since this is a question about effect on

meat industry, the “discuss” means that elasticities must be applied  
 Content = “how the conventional meat industry would be affected” → Need to do analysis of P & Q in the market  
 Context = conventional meat market

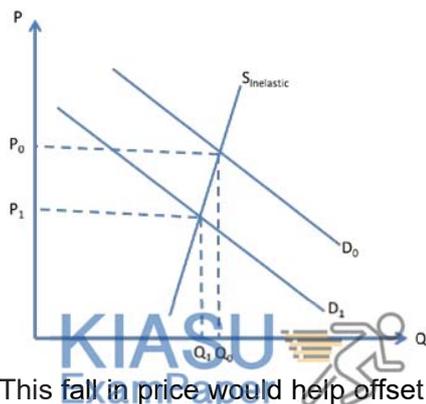
Introduction: Background of “more hungry mouths” and that “global warming is threatening yields” (Extract 2)

With “more hungry mouths” due to the increase in global population, the demand for conventional meat would increase. At the same time, “global warming threatening yields” would cause a reduction in the supply of grains that would then drive up the price of grains. Since conventional meat production requires the livestock to be fed with grains, the cost of production of meat would increase, causing the supply of conventional meat to fall. Combining the effects, this would cause an increase in price of conventional meat while the quantity traded is indeterminate.

Body: Effect of lab-based meat and “meatless Monday” campaign

Lab-based meat is a substitute for conventional meat. So, the development of it would reduce the demand for conventional meat as some consumers would switch away to consuming lab-based meat instead of conventional meat. The “meatless Monday” campaign would further add to the fall in demand by changing consumers’ tastes and preferences away from conventional meat. This reduction in demand would cause a surplus of conventional meat and hence a reduction in price and quantity traded of conventional meat.

Additionally, since conventional meat is perishable and cannot be stored for too long, the supply of meat is price inelastic. As such, the reduction in price of conventional meat would only cause a less than proportionate fall in the quantity supplied of it. This means that the reduction in price would be to a large extent while the reduction in quantity traded would be to a small extent. This is illustrated in the diagram below.



This fall in price would help offset some of the increase in price of conventional meat caused by the growing population and fall in yields due to climate change. However, since the reduction in quantity is only to a small extent, the quantity traded would remain indeterminate.

Conclusion

Overall, whether the lab-based meat and campaign will only offset or reverse

the increase in price of conventional meat would depend on time period. In the short run, the development of lab-based meat and the “meatless Monday” campaigns are unlikely to have much effect as both events will require a long time before a significant effect on the demand of conventional meat can be observed. Thus, the price of conventional meat is likely to continue to increase. In the long run, however, as lab-based meat becomes a viable substitute for conventional meat and the “meatless Monday” campaign gains traction, the price of conventional meat would start falling instead.

Level	Descriptor	Marks
3	Explains how “more hungry mouths” and “global warming threatening yields” would affect the conventional food market using demand and supply analysis, and explains the effects of the development of lab-based meat and campaigns like the “Meatless Monday” movement using demand and supply analysis and an appropriate elasticity concept.  Max 6m if demand and supply analysis is applied both in setting the context and analysing the effects of lab-based meat and “meatless Mondays” campaign but elasticity concepts are not applied at all.	6-8
2	Only explains the effects of the development of lab-based meat and campaigns like the “Meatless Monday” movement using demand and supply analysis and an appropriate elasticity concept. Context of “more hungry mouths” and “global warming threatening yields” not analysed (only described/not mentioned at all)	3-5
1	Only explains the effects of the development of lab-based meat and campaigns like the “Meatless Monday” movement using demand and supply analysis.	1-2
E	Makes a judgement that answers the question, and justifies the judgement.	1-3

Question 2

<b>(a)</b>	<b>(i)</b>	Identify which country has the highest nominal GDP growth in 2018 and support your answer with a calculation.	<b>[2]</b>
		<p>China [1].</p> <p>Since Nominal GDP = Real GDP + inflation, 6.6 + 2.9 is the highest amongst the three countries. [1]</p> <p><i>Identify [1 mark]</i> <i>Calculation [1 mark]</i></p>	
<b>(b)</b>	<b>(i)</b>	Compare the trend of United States Trade Balance in goods with China with that of Singapore.	<b>[2]</b>
		<p>Difference: US has a trade deficit with China but a trade surplus with Singapore [1] Similarity: Trade deficit with China and trade surplus with Singapore is worsening [1]</p>	
	<b>(ii)</b>	With reference to Extract 5 and Figure 1, explain whether the data shows that China is manipulating its currency.	<b>[4]</b>
		<p>Currency manipulation occurs when a country manipulates its exchange rate, specifically, devaluing its exchange rate.</p> <p><u>Thesis:</u> China is manipulating its currency by devaluing the RMB as US's trade deficit with China is worsening as seen in Figure 1. When China devalues its currency, prices of imported goods and services are now more expensive from US. Hence, consumers will switch to buying from domestic producers instead, which reduces the demand for US's exports. On the other hand, prices of exports in terms of foreign currency are now cheaper. This results in US buying more of China's exports. As such, US's import expenditure from China increases and US's export revenue to China falls. This results in the worsening trade deficit.</p> <p><u>Anti-thesis:</u> There is another reason to account for the fall in external value of Chinese RMB. As stated in Extract 5, US increased its interest rates, led to an increase in demand for US dollar, resulting in USD appreciating against RMB, which means that RMB has depreciated against USD.</p> <p><i>Explanation, with reference to data, how China is manipulating currency [2]</i> <i>Explanation, with reference to data, why US's currency is appreciating against China is due to other reasons [2]</i></p>	

(c)		[7]
	<p>Explain the positive impacts of Federal Reserve's decision to raise interest rates on the US economy and comment on its appropriateness.</p> <p><u>Explain how contractionary monetary policy (interest rates based) works and how it meets macroeconomic aims of US.</u></p> <p>As interest rate is both the cost of borrowing and the return on savings, a rise in interest rates leads to consumers borrowing less money to spend and saving more instead. This decreases C [1]. At the same time, with the higher cost of borrowing, firms would find it less profitable to invest. [1] The decrease in C and I then leads to a decrease in AD, causing a fall in GPL and offsetting any inflationary pressures as US is facing an inflation rate of 2.3% in 2018. [1] At the same time, NY will fall [1].</p> <p><u>Comment:</u> The impact of the increase of interest rates on US's economy depends on the state of US's economy. With the increase in interest rates, it will cause AD to fall further, resulting in a decrease in NY and hence actual growth. This acts as a drag on US's economy, especially when its growth rate is only at 2.9%. Hence, an increase in interest rate may result in US falling into a recession. [1] Furthermore, inflation is not really an issue that US is grappling with, since the general prices are increasing slowly at 2.3% in 2018. Due to the state of US's economy now, the increase in interest rates may not be appropriate. [1]</p> <p><i>Mark allocation:</i> "Explain" [4m] Explain how interest rates affect C [1] and I [1] and hence GPL [1] and NY [1]. Explain how interest rates affect M. [1] Explain how interest rates affect X [1] and hence BOT. [1]</p> <p>"Comment" [3m] State whether increase in interest rate is appropriate. [1] Explain why increase in interest rate is appropriate or not with reference to the data. [2]</p>	
(d)	(i)	[2]
	<p>Identify which country has the largest change in real GDP per capita in 2018 and support your answer with a calculation.</p> <p>China [1]</p> <p>Since <math>\text{growth in real GDP per capita} = \text{Real GDP growth} / \text{Population growth}</math>, <math>6.6 / 0.5 = 13.2</math>, which is the largest change amongst the three countries. [1]</p> <p><i>Identify [1 mark]</i> <i>Calculation [1 mark]</i></p>	

	(ii) Assess whether China, USA or Singapore has the greatest improvement in standard of living.	[8]
	<p><u>Introduction:</u> Define standard of living (SOL)</p> <p><u>Thesis: China has the greatest improvement in SOL in 2018</u></p> <p>Material SOL refers to the quantity of goods and services available to the citizens of the country. Since China experienced the largest increase in real GDP per capita in 2018 as compared to Singapore and USA, the Chinese citizens have a greater increase in disposable income, and hence purchasing power. As such, they experience a greater increase in quantity of goods and services available to them. They are also able to afford better education and healthcare and as such, their non-material SOL improves.</p> <p>Since China has the greatest improvement in real GDP per capita, the Chinese government is also able to collect greater amount of taxes. If this increase in tax revenue is spent on improving the infrastructure for public and merit goods, Chinese citizens will experience a greater improvement in non-material SOL.</p> <p>From Table 3, China also experienced the largest increase in HDI from 2014 to 2017, while Singapore experiencing the small increase. This means that the improvement in terms of literacy rate and life expectancy is the highest. As such, China's non-material SOL has improved the largest amongst the three economies.</p> <p><u>Anti-thesis: China may not have the greatest improvement in SOL in 2018</u></p> <p>However, China may not have the greatest improvement in SOL in 2018 as compared with Singapore. This is because China's unemployment rate is higher than Singapore. This means that there is an increase in number of Chinese citizens who are unemployed in 2018. As such, there are more people with fewer disposable income and hence purchasing power, which reduces their material standard of living, as compared to Singapore.</p> <p>In addition, the larger increase in real GDP may not be distributed evenly across the country, resulting in the average person having lesser improvement in income as compared to the other countries.</p> <p>The largest improvement in SOL in China may have come at the expense of its environment. With more goods and services being produced, there may be increased burning of fossil fuels, which pollutes the environment. Hence, there may be an increase in number of people who are falling sick due to the increase in pollutants in the air in China. As such, non-material SOL in China may not have improved as compared to the other countries.</p> <p><u>Evaluation and Conclusion:</u></p>	

		<p>While China's SOL as compared to the USA and Singapore has seen the largest improvement on average according to Table 2, we will require additional data, such as the change in Gini Coefficient, to find out whether income equality in China has the largest improvement in order to safely say that material SOL in China has improved the most. We also need more data to analyse the change in pollutants in the air, to find out whether China's non-material SOL has indeed improved by a larger extent as compared to USA and Singapore.</p> <table border="1"> <thead> <tr> <th>Level</th> <th>Descriptor</th> <th>Marks</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>Explains how the data shows that China may and may not have the largest improvement in standard of living as compared to USA and Singapore.  Well-explained thesis or anti-thesis – max 4m</td> <td>4-6</td> </tr> <tr> <td>1</td> <td>Answer lacks depth in terms of economic analysis. Answer did not explicitly compare the change in standard of living over space and over time.</td> <td>1-3</td> </tr> <tr> <td>E</td> <td>Makes a judgement that answers the question, and justifies the judgement.</td> <td>1-2</td> </tr> </tbody> </table>	Level	Descriptor	Marks	2	Explains how the data shows that China may and may not have the largest improvement in standard of living as compared to USA and Singapore.  Well-explained thesis or anti-thesis – max 4m	4-6	1	Answer lacks depth in terms of economic analysis. Answer did not explicitly compare the change in standard of living over space and over time.	1-3	E	Makes a judgement that answers the question, and justifies the judgement.	1-2	
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E	Makes a judgement that answers the question, and justifies the judgement.	1-2													
(e)	(i)	Explain why "Singapore conducts monetary policy not by targeting interest rates, but by managing the Singapore dollar nominal effective exchange rate (S\$NEER) within a policy band" (Extract 4).	[8]												
		<p><b>Explain that SG is an interest rate taker.</b> To use interest rates as an instrument, Central banks must have control over the money supply to change the interest rate. However, Singapore has no control over the money supply due to the small and open nature of the economy. [1]</p> <p>Suppose Singapore wants to increase the interest rate, this causes the interest rate in Singapore to be more than interest rates in the rest of the world. As such, there would be large inflows of 'hot' money into Singapore since the returns on 'hot money' would be higher in Singapore than in the rest of the world. The inflow of 'hot money' would increase our domestic money supply and drive down the interest rate in Singapore to the same level as the world interest rate. [1] To prevent this from happening (to maintain a high interest rate as originally intended), the MAS would need the ability to absorb the inflow of 'hot money' to prevent the money supply from expanding. However, being a small economy, it lacks the ability to do so as the 'hot money' flows would be too large relative to the domestic money supply. [1] As such, the 'hot money' flows will ensure that the interest rates in Singapore follow the global interest rates [1].</p> <p><b>Explain that exchange rate has a larger impact on SG's economy.</b></p>													

	<p>Singapore also uses exchange rate instead of interest rates because exchange rates have a larger effect on the Singapore economy. This is due to our lack of natural resources and our dependence on (X-M). [1]</p> <p>Singapore's lack of natural resources causes it to import most of the raw materials needed for producing goods and services. We also import a lot of the final goods and services we consume. This makes us very susceptible to imported inflation. This makes exchange rate policy more effective than interest rate policy in curbing inflation since interest rate policy does not target imported inflation but exchange rate policy does. [1]</p> <p>Additionally, Singapore's small size means that domestic consumption and investment are relatively low. To grow, Singapore needs to increase AD through exporting overseas. This has resulted in the (X-M) component of AD for Singapore to be higher. Again, this makes exchange rate policy is more effective than interest rate policy as it targets (X-M) while interest rate policy doesn't. [1]</p> <p>Finally, due to the low level of domestic investments, most of the investments in Singapore are foreign direct investments. FDI is not influenced by domestic interest rates as their funding is from overseas. [1]</p>	
	<p><b>(ii)</b> In light of the current economic outlook, assess whether Singapore should change its policy stance of "monetary policy tightening" (Extract 7).</p>	<p><b>[12]</b></p>
	<p><u>State what monetary policy tightening means in the context of Singapore</u></p> <p>Monetary policy tightening means that Singapore is appreciating its currency.</p> <p><u>Explain how "monetary policy tightening" affects SG's economic aims</u></p> <p>An appreciation will cause imports to be cheaper in SGD. Since Singapore imports a lot of raw materials, an decrease in price of imported raw materials will result in a fall in costs of production. As such, SRAS will increase, resulting in a downward shift of the SRAS curve, and hence reduce the general price levels. Thus, an appreciation of SGD helps to mitigate cost-push inflation, in particular imported inflation.</p> <p>Monetary policy tightening also helped to curb demand-pull inflation in Singapore, especially since (X-M) constitutes a large component of our GDP. An appreciation will cause exports to become more expensive in foreign currency and imports to be cheaper in domestic currency. This will cause a fall in the quantity demanded of exports as foreigners buy less of the exports and a rise in quantity demanded of imports as locals switch to buy more of the cheaper imports. Hence, assuming that both PED<sub>x</sub> and PED<sub>m</sub> are elastic, X-M would decrease, which will lead to a fall in AD, reducing GPL and hence curbing demand-pull inflation.</p> <p><u>Thesis: SG should change its policy stance</u></p>	

According to Extract 7, there are uncertainties in the global economy. As a result, Singapore's trade has been sluggish, hence (X-M) is increasing slowly. At the same time, due to the economic slowdown in China, the Chinese experience a fall in national income and hence purchasing power. This means that they will demand for fewer goods and services, including imports. Since Singapore and China are trading partners, Singapore's demand for exports from China will fall, resulting in a fall in (X-M) and hence AD. This will act as a drag on Singapore's economic growth.

In addition, there global oil prices are expected to fall (Extract 7). This means that cost of production is expected to fall, resulting in an increase in SRAS and hence a fall in GPL. This curbs cost-push inflation, in particular imported inflation as Singapore imports oil.

Given the above events, inflation is not an issue that is facing Singapore. This is also corroborated with the low inflation rate of 1.9% in 2018 as seen in Table 2. As such, the current monetary policy tightening stance should change as the current policy is less relevant. Since Singapore's economic growth is expected to slow, the MAS should consider adopting a zero appreciation policy so as to remove the drag caused by the monetary policy tightening as well as the fall in demand for Singapore's exports.

Anti-thesis: Singapore should not change its policy stance

If Singapore changes its currency stance to that of depreciation so as to increase its (X-M), according to Extract 5, the depreciation could likely destabilise countries in Asia due to the relatively high levels of US dollar denominated corporate debt accumulated by many Asian firms. With depreciation of SGD, USD is now more expensive in terms of SGD. As a result, the debt, which is incurred in terms of USD, will be more expensive for Singapore firms to repay. This may result in a fall in investments due to the repayment of the debt, resulting in a fall in AD and hence the fall in national income, worsening economic growth.

Hence, the Singapore government should continue its policy stance of gradual and modest appreciation.

Conclusion:

Whether the Singapore government should change its policy stance depends on whether the benefits of the continuation of the gradual appreciation of exchange rate outweighs the costs. Given the poor economic outlook as well as Singapore's current state of the economy, continued appreciation may result in the worsening of the slowdown of economic growth. However, since Singapore depends on imported goods and services, depreciation of SGD may also bring out negative impacts. As such, MAS should consider easing the gradual appreciation to the drag on Singapore's economic growth, given the current economic outlook.

Level	Descriptor	Marks
3	Explains the reasons for and against Singapore changing its monetary policy stance. Explanations take into account the current economic outlook.	7-9
2	Explains the reasons for or against Singapore changing its monetary policy stance.	4-6
1	Answer lacks depth in terms of economic analysis. For an answer that explains how exchange rate policy works.	1-3
E2	Makes a judgement that answers the question and justifies the judgement	2-3
E1	Makes a judgement that answers the question	1

