VICTORIA JUNIOR COLLEGE
JC2 PRELIMINARY EXAMINATION 2022
HIGHER 2

ECONOMICS
Paper 1

9757/01
13 September 2022
2 hours 15 minutes

No Additional Materials are required.

READ THESE INSTRUCTIONS FIRST

An answer booklet will be provided with this question paper. You should follow the instructions on the front cover of the answer booklet. If you need additional answer paper, ask the invigilator for a continuation booklet.

Answer **all** questions.

The number of marks is given in brackets [ ] at the end of each question or part question.

[Turn over

This document consists of **7** printed pages.
Answer **all** questions.

Question 1: The road to clean energy

Extract 1: Climate change

2019 was the second warmest year on record. Carbon dioxide (CO2) levels and other greenhouse gases in the atmosphere rose to new records in 2019. Climate change is affecting every country on every continent. It is disrupting national economies and affecting lives. Weather patterns are changing, sea levels are rising, and weather events are becoming more extreme.

Saving lives and livelihoods require urgent action to address both the coronavirus pandemic and the climate emergency. The Paris Agreement adopted in 2015, aims to strengthen the global response to the threat of climate change by keeping a global temperature rise this century well below 2 degrees Celsius above pre-industrial levels.

Source: United Nations. https://www.un.org/sustainabledevelopment/climate-change/

Extract 2: Going Green – What's good for the planet is good for business

Increasingly, businesses around the world are responding to a global imperative and consumer demand to go green. More than 80 per cent of people respect companies and brands that adopt eco-friendly practices, according to an international survey. More than half boycott companies with unsustainable practices or products.

"Consumers want to make responsible 'green' purchases, but do not always have the means to do so," the report says. "For brands, this is an opportunity." Shoe company Adidas, for instance, produced 7,000 limited edition sneakers made completely from plastic trash retrieved from the ocean. The sneakers sold out instantly.

Source: Forbes, 14 May 2019

Extract 3: China cuts electric vehicle subsidy for 2021

On December 2020, the Chinese Ministry of Finance announced the new electric vehicle (EV) subsidy policy for 2021. This included a 20 per cent reduction year on year as planned. Under the new policy for 2021, the subsidy for pure electric vehicles (PEVs) with a driving range of 300-400km will be lowered to 13,000 yuan per vehicle, from 16,200 yuan in 2020.

The outbreak of the coronavirus early last year put huge pressure on China's EV industry with output and sales falling by more than 50 per cent year on year in the first three months of 2020.

Source: Fastmarkets, 5 Jan 2021

Table 1: Price and cross-price elasticity matrix for gasoline cars and battery electric cars

Cross price elasticity of demand	With respect to price of gasoline cars	With respect to price of battery electric cars
For gasoline cars	-1.08	0.19

For battery electric cars	0.36	-1.27

Source: European Transport Research Review, 04 Jan 2021

Extract 4: The global lithium market

The global lithium market is estimated to grow by around 8 to 10 per cent annually from 2019 to 2024. Lithium is needed to manufacture glass, ceramics, and lithium-ion batteries that power electric vehicles (EVs).

Australia, Chile, and Argentina account for nearly 89 per cent of global lithium production. Lithium is predominantly sourced from brines such as salt lakes and salt flats as it is cheaper to extract as compared to hard rock ores and salt deposits.

China is the biggest consumer of lithium — making up more than 55 per cent of the global demand — and is the largest manufacturer of lithium-converted products. The lithium-ion battery sector accounts for about 60 per cent of the lithium demand in China, with EV and portable electronics as the largest demand drivers.

EVs made up less than 1 per cent of the world's cars in 2019. However, according to investment bank USB analysts, EVs will reach a price parity with gas-powered cars by 2024. For this reason, UBS projects that EVs will make up nearly half of all new car sales by 2030. UBS estimated that the lithium market will grow 8 times by 2030.

Where will the world get all the lithium to produce lithium-ion batteries? Lithium is not a rare metal. There's plenty of it but it needs to be mined, using large-scale operations to extract it—and these might take years to explore and set up. Since 2018, lithium prices have crashed 60-70 per cent to rock-bottom lows. The drawdown forced miners to cut back on operations and call off the exploration of new mines.

Sources: GEP.com (accessed in June 2022) and Forbes, 7 Dec 2020

Extract 5: Lithium supply

The supply base for lithium is expected to diversify over the next decade, even as South American and Australian output increases. As of 2020, brine-based lithium sources were in various stages of development in Argentina, Bolivia, Chile, China, and the US, and mineral-based lithium sources were being developed in Africa, Australia, South America, Canada, and Europe, according to the US Geological Survey. In addition, new mining techniques and types of deposits are expected to supplement traditional sources.

However, investors have been somewhat hesitant to commit to new mines due to doubts over the duration of the boom in lithium demand. New battery technologies could begin to replace lithium- ion in 15 years.

Source: Physics Today 74, 5, 20 (2021)

Table 2: Lithium Market Balances (tons)

	2018	**2019**	**2020**	**2021***	**2022***	**2023***	**2024***
Demand	268 362	300 429	340 662	429 484	584 989	722 701	899 622
Supply	278 508	323 988	343 712	403 340	461 953	563 375	711 683
Market balance	10 146	23 559	3050	-26 144	-123 035	-159 326	-187939

(+surplus/-deficit)							

* The figures for 2021 to 2024 are estimates.

Source: Physics Today, 74, 5, 20 (2021)

Extract 6: Asia Pacific must phase out fossil fuel subsidies

The extent to which Asia-Pacific is planning on decarbonising will make or break the global fight against climate change. Asia-Pacific is home to 60 per cent of the world's population and the main engine of global economic growth. However, since the early 2000s, Asia-Pacific has been the main carbon dioxide emitting region, producing about half of the world's total emissions.

All in all, coal in China and India is currently the single biggest contributor to global greenhouse-gas emissions. China continues to subsidise coal for the following reasons: 1) to provide cheap electricity and heating to citizens, as coal plants remain a low-cost electricity supply option compared to natural gas and offshore wind; 2) to foster international industrial competitiveness by using cheaper electricity for production; and 3) to support the coal industry, which employs about six million workers, mainly in north-eastern provinces that suffered most growth-wise since 2015.

Source: Brink News, 7 June 2021

Extract 7: China has no choice but to rely on coal

China President Xi Jinping said that the country's carbon emissions would begin to decline by 2030, and he said the country will reach carbon neutrality by 2060. In the meantime, policymakers are making clear that economic growth remains a top priority — and that growth depends largely on coal power.

"China's energy structure is dominated by coal power. This is an objective reality," said Su Wei, deputy secretary-general of the National Development and Reform Commission. He added that coal is readily available, while renewable energy needs to develop further in China.

Source: CNBC, 29 April 2021

Questions

(a) Explain how an effect of climate change could be considered an external cost. **[2]**

(b) Explain why a firm's transition to low carbon activities could impact its profits positively. **[3]**

(c) Using a diagram, explain how a reduction in subsidies for electric vehicles (Extract 3) will affect consumer surplus in the market for electric vehicles. **[4]**

(d) Explain how the information in Table 1 could be used to explain that a reduction in subsidies for electric vehicles could accelerate climate change. **[3]**

(e) Discuss the extent to which the price of lithium can be expected to rise beyond 2024. **[8]**

(f) Discuss the case for and against the subsidisation of coal by governments of countries like China. **[10]**

[Total: 30]

Question 2: Can we bring together a disconnected world?

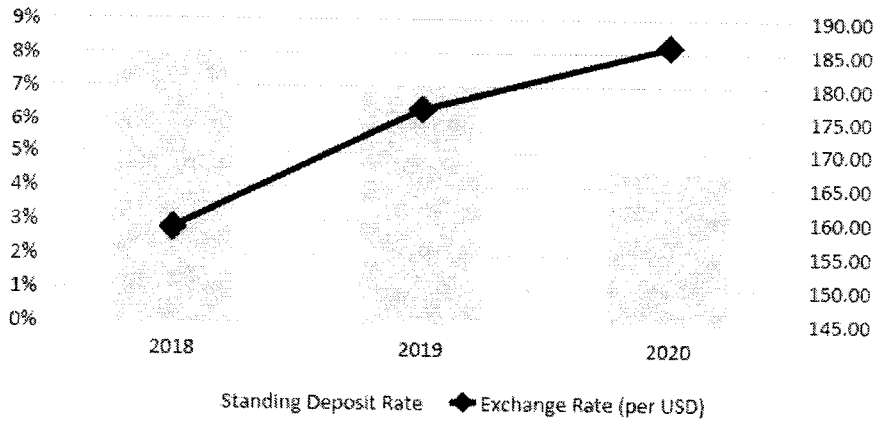
Table 3: Trade Openness Index[1] for selected countries (2018 – 2020)

Country	2018	2019	2020
China	37.57	35.89	34.51
Singapore	325.34	323.52	320.3
Sri Lanka	53.51	52.38	39.52
USA	27.48	26.29	23.38

[1] The Trade Openness Index is based on the sum of the country's exports and imports as a percent of the country's GDP

Source: The Global Economy, accessed July 2022

Figure 1: Sri Lanka Standing Deposit Rate[2] and Exchange Rate (per USD) (2018 – 2020)



[2] The standing deposit rate is the benchmark interest rate set by the Central Bank of Sri Lanka

Source: Central Bank of Sri Lanka and XE Currency, accessed July 2022

Extract 8: A nation due for a change

The sum of Sri Lanka exports and imports account for 53 per cent of its GDP in 2018. Sri Lanka's exports were hurt in the short term due to the supply chain disruptions as well as the collapse in global demand for its goods and services during the pandemic. The situation has not been helped by the fact that Sri Lanka's export markets and products are highly concentrated in textile and food products. Moreover, Sri Lanka's imports exceeded exports over the years, leading to a deteriorating trade balance.

Multi-national corporations (MNCs) are now actively seeking new suppliers and manufacturing locations outside of China with the rising cost of production in China and to diversify their supply-chains and risk – from electronics and appliances to auto-parts and precision components, to textiles and garments. There is an opportunity for countries like Sri Lanka to benefit from supply chain disruptions and realignment as MNCs seek to lower their cost of operations. Sri Lankan firms with capabilities in these sectors, together with the government, need to attract these global companies seeking alternate manufacturing or sourcing locations.

Source: Korean Institute for International Economic Policy, 2020

Extract 9: A path forward?

In the face of the world's superpowers focusing on their domestic agenda, Sri Lanka should continue with gradual market-oriented reforms to capitalise on the renewed Regional Comprehensive Economic Partnership (RCEP) trade agreement between ASEAN members, China, Japan, South Korea, Australia, and New Zealand to continue diversify its trade. One measure is to cut the red tape hampering businesses to attract greater foreign direct investment (FDI) from other sources and make Sri Lankan exports more competitive. It takes as long as nine days to start a business in Sri Lanka and only 2.5 days in Singapore.

It is also important for Sri Lanka to continue with macroeconomic stabilisation efforts, including fiscal consolidation, and better budget and debt management to encourage foreign investment. In this regard, staying the course in the current International Monetary Fund (IMF) programme of reducing fiscal debt is crucial, as Sri Lanka faces historically high debt repayments of around four billion USD per year between 2019 and 2022. If uncontrolled, there is a risk of debt spiral and put Sri Lanka on the road to national bankruptcy.

Source: Lakshman Kadirgamar Institute, March 2018

Extract 10: A world less connected

The COVID-19 pandemic is driving the world economy to retreat from global economic integration. Policymakers and business leaders are now questioning whether global supply chains have been stretched too far. National security and public health concerns are providing new rationales for protectionism, especially for medical gear and food, and an emphasis on domestic sourcing.

This retreat will not mark the end of globalisation, a process that has reached a historically high level. But globalisation can be reversed, at least partially. The Great Recession of 2008 marked a historic turning point in the degree of global economic integration. Now, in response to the

current health and economic crisis, policymakers appear poised to take deliberate steps to reinforce the movement toward deglobalisation.

While trade has tended in past decades to grow more rapidly than world output, that is no longer the case. Several factors have been at work. Under President Xi Jinping, China began to turn inward with policies to promote the indigenous development of leading industries while under President Donald Trump, the United States has embraced an 'America First' policy, shifting away from trade liberalisation and moving toward protectionism. The US also initiated a trade war with China over its unfair trade practices, significantly reducing bilateral trade.

Source: VoxEU, Centre for Economic Policy Research, May 2020

Extract 11: Impact of a disconnected world

It is folly to think that a chaotic, crisis-driven retreat from globalisation will not introduce more – and vastly more serious – problems. Even the US, with its highly diversified economy, world-leading technology, and strong natural-resource base, could suffer a significant decline in economic growth because of deglobalisation. For smaller economies and developing countries that are unable to reach critical mass in many sectors and often lack natural resources, a breakdown in trade would reverse many decades of growth.

In 2020, over 26 per cent of the global FDI stock was invested in the United States. By comparison, the second most popular destination, China (including Hong Kong), accounted for only 9.2 per cent with Singapore taking up 7.5 per cent. Few countries will be spared by the looming spectre of deglobalisation, which threatens cross-border trade and investment, worrying business leaders, workers, and policymakers.

Source: Channel News Asia, June 2020 and Forbes, Jan 2021

Questions

(a) Using Figure 1,

i) State and explain the relationship between Sri Lanka's exchange rate and standing deposit rate. **[3]**

ii) Explain how the change in Sri Lanka's exchange rate will affect its balance of trade. **[4]**

(b) i) With reference to Table 3, describe the change in the countries' Trade Openness Index over the period 2018 – 2020. **[1]**

ii) With reference to Extract 10, suggest and explain **two** possible reasons for the above change. **[4]**

(c) Assess whether it is more crucial for Sri Lanka to reduce its balance of trade deficit or its fiscal budget deficit to improve its economic performance. **[8]**

(d) Using the case material and your own knowledge, discuss the extent to which deglobalisation will adversely affect small economies more than larger economies. **[10]**

[Total: 30]

VICTORIA JUNIOR COLLEGE
JC2 PRELIMINARY EXAMINATION 2022
HIGHER 2

ECONOMICS

9757/02

Paper 2 Essays

31 August 2022

2 hours 15 minutes

No Additional Materials are required.

READ THESE INSTRUCTIONS FIRST

An answer booklet will be provided with this question paper. You should follow the instructions on the front cover of the answer booklet. If you need additional answer paper ask the invigilator for a continuation booklet.

Answer **three** questions in total, of which **one** must be from Section A, **one** from Section B and **one** from **either** Section A or Section B.

The number of marks is given in brackets [ ] at the end of each part question.

Answer **three** questions in total.

Section A

One or two of your three chosen questions must be from this section.

1 In 2020, the Singapore government distributed reusable masks to all households. It highlighted that besides protecting others, the wearing of face masks can protect oneself better from the spread of COVID-19. During that same period, Singapore saw rising sale of fake face masks which are sub-standard masks with ineffective filtration layers.

(a) Explain how consumer ignorance and asymmetric information could lead to an inefficient allocation of resources in the market for face masks. [10]

(b) Evaluate the alternative policies that can be adopted by the Singapore government to correct both these market failures. [15]

2 Food in restaurants and hawker centers have risen with food prices at restaurants having increased at a faster pace compared to hawker food. Food vouchers for hawker centers have been issued by the Singapore government to help the lower-income households.

(a) Using the demand-supply model, explain why the price of food in restaurants rose at a faster rate compared to food in hawker centres when energy cost rose. [10]

(b) Discuss whether providing food vouchers is the best measure the Singapore government can undertake to address the rising price of food. [15]

3 Nike is the market leader in the global sports footwear industry. Nike's business strategies include building its brand through sports celebrity endorsements, developing products that have high-quality, market-leading technology and acquiring competing sports brands.

(a) Explain **two** ways in which a profit-maximising firm like Nike could benefit from acquiring another firm in the same industry. [10]

(b) Discuss the view that governments should stop firms from acquiring other firms in the same industry. [15]

Section B

One or two of your three chosen questions must be from this section.

4 Due to the outbreak of COVID-19, Singapore closed its borders to short term visitors and some foreign labourers in 2020.

(a) Using AD-AS analysis, explain how the closure of international borders can adversely affect an economy. [10]

(b) Discuss how different countries will adopt different policies to tackle these consequences. [15]

5 Monetary policy - generally conducted by central banks such as the US Federal Reserve or the European Central Bank - is a policy tool for achieving low inflation and economic growth.

(a) Explain the economic consequences when central banks are unable to achieve low inflation. [10]

(b) Assess the likely impact on the living standards of Singapore residents when the US central bank cuts interest rate. [15]

6 Singapore is one of the most competitive economies globally. Businesses in Singapore receive government support to uplift productivity, strengthen capabilities, and access new markets.

(a) Explain the reasons why a country's comparative advantage might change over time.

[10]

(b) Discuss the extent to which the measures adopted by the Singapore government aimed at increasing global competitiveness might cause difficulties for its economy.

[15]

Victoria Junior College
2022 H2EC Prelim Exam Paper 1
Answers and Mark Schemes

Question 1

(a)		**Explain how an effect of climate change could be considered an external cost.** - 1m for identifying a relevant external *cost* that is associated with climate change. - 1m for explaining that it is an external cost because it is incurred by 3rd parties. The adverse effects of climate change include loss of crops due to flood/drought, which could cause the income of farmers to be lost. (1) This loss of income are costs incurred by third parties (like farmers) who are not participants of the markets in which production activities led to CO2 emissions that caused the global warming. (1)	[2]
(b)		**Explain why a firm's transition to low carbon activities could impact its profits positively.** - 1m for firm responding to change in consumers' preferences for green products - 1m for explaining that rise in DD enables firm to charge more and sell more and hence TR rises - 1m for linking rise in TR to rise in profits by <u>assuming</u> that TC rise by less TR. Consumers want to make green purchases (Extract 2) *due to a change in their taste/preferences* which means they have become *more willing to pay* for green products. Thus, by going green, a firm will be able to increase the demand for its product (1). The rise in demand and hence AR and MR leads to increase in the firm's profit-maximising output and enables it to charge a higher price. This increases the firm's TR. (1) While investing in low carbon technologies could increase the firm's fixed costs and if the TR rises by more than TC, the firm's total profits rise. (1)	[3]
(c)		**Using a diagram, explain how a reduction in subsidies for electric vehicles (extract 3) will affect consumer surplus in the market for electric vehicles.** Reduction in subsidies lead to rise in marginal cost of producing electric vehicles (EVs). (1)	[4]

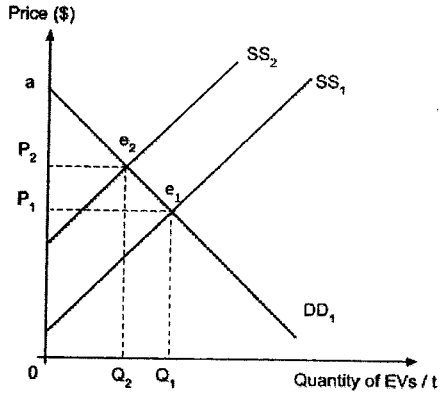
		This leads to fall in supply from SS1 to SS2 which causes the price of EVs to rise and the quantity bought to fall. (1)  Diagram (1) Consumer surplus falls from area ae_1P_1 to area ae_2P_2. (1)	
(d)		**Explain how the information in table 1 could be used to explain that a reduction in subsidies for electric vehicles could accelerate climate change.** - 1m for identifying the relevant information - 1m for interpreting the XED value - 1m for linking GCs to climate change	[3]

Table 1 shows that the cross price elasticity of demand for gasoline cars *with respect to a change in price of EV* (XED_{GE}) is positive with a value of 0.19. (1)

Thus, when price of EV rises due to the reduction in subsidies, motorists will be more willing to substitute towards gasoline cars which has become relatively cheaper, causing *demand* for gasoline cars to increase. (1).

This will accelerate climate change as gasoline cars is a source of CO2 emission. (1)

(e) **Discuss the extent to which the price of lithium can be expected to rise beyond 2024.** [8]

Introduction

The extent to which the price of lithium is expected to rise beyond 2024 depends on whether demand will continue to outweigh supply.

Body

Explain demand factors that affect the price of lithium

DD Factors

1. Demand for lithium is expected to rise significantly beyond 2024 due to rising demand for EVs.

   Due to shifting tastes and preferences towards environmental conscious goods (Ext 2), consumers are more willing to buy electric vehicles (EV) at all prices. This causes a rise in demand, where EV sales are estimated to make up almost half of new car sales by 2030 (Ext 4).

   [Alternative factor to explain rise in Qd for EVs is govt subsidization of EVs]

   The rise in demand for electric vehicles will in turn cause the derived demand for lithium to increase as lithium is a key factor input in the production of electric vehicles as a key ingredient in the battery technology.

   Therefore, demand for lithium is expected to rise beyond 2024 significantly, contributing to upward pressure on price.

2. The rise in demand for lithium might slow over time and might fall

Due to continued improvements in battery technology, the rise in demand for lithium may be limited when the use of lithium might be outdated or phased out to make way for new battery technologies in 15 years (Ext 5). Thus, EV manufacturers that may be willing to use these new battery technologies will switch away from lithium batteries, [L] causing the derived demand for lithium to fall eventually. This contributes to downward pressure on price.

Explain the SS factors that affect the price of lithium

SS Factors

1. Supply for lithium is expected to rise due to entry of new firms.

   With rising demand for lithium, prices will rise in the short run, leading to supernormal normal profits which will attract new firms to join the global lithium market in the long run.

   As seen from Ext 5, the supply base for lithium is expected to diversify from 2020 onwards, where more countries like Australia and Canada are being developed as new sources for lithium. This will increase the number of sellers for lithium, which in turn raise supply for lithium.

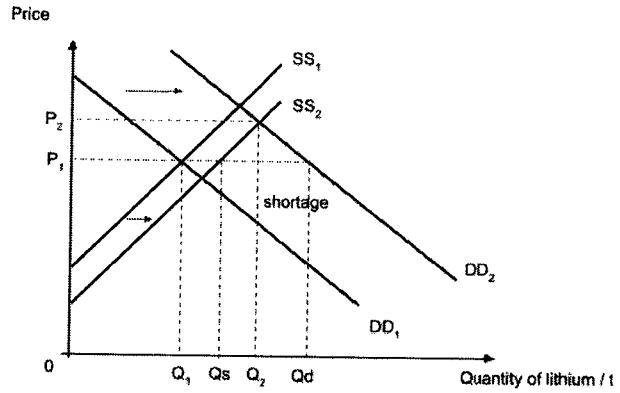
   According to Ext 4, there is plenty of un-exploited lithium in the world. Thus, there is the possibility of supply rising by enough to match the rise in demand or exceed the rise in demand (described earlier) over time.

2. Moreover, new mining techniques will be developed over time (Ext 5).
   This will lower MC of producing lithium, further boosting supply.
   Rising supply puts downward pressure in price.

Impact of changes in demand and supply on price of lithium

It is possible for demand to rise by more than supply beyond 2024. While the rise in demand for lithium is expected to rise greatly (prior to the invention of alternatives to lithium batteries), it takes time to explore and set up new mines (Ext 4), there is excess of demand over supply seen in 2021 to 2024 (Table 2), and this will likely continue to hold beyond 2024 because it takes a long time to construct new mines.

Figure 1: Lithium market beyond 2024 (short term)



With the rise in DD from DD_1 to DD_2 outweighing the rise in SS from SS_1 to SS_2, there will be a shortage (Qd – Qs) at the initial price level. This results in an upward pressure on prices. Thus, lithium prices will likely rise beyond 2024 from P_1 to P_2 where Qs = Qd and equilibrium is restored

Conclusion [Evaluation]

To a large extent, price of lithium can be expected to rise (i.e. price is more likely to rise instead of fall) over the next 10 to 15 years **(short and long run).** On the other hand, it is only to a very small extent that price is expected to continue to rise in the **very long run.**

- The rise in demand should persist. This is because the *factors that are currently driving up the demand for EVs and hence lithium, are likely to be sustained.* Besides rising environmental consciousness that partly drives the rising demand for EV, the price of EVs has been falling (Ext 4 - EVs will reach a price parity with gas-powered cars by 2024). Technological advancement in manufacture of EVs should bring the price of EVs further down. Thus, the derived demand for lithium will continue to rise, at least until lithium batteries are replaced one day.
- While there is potential for supply of lithium to rise and match the rising demand for lithium given its wide availability, profit-motivated lithium mining firms have been hesitant to invest in new lithium mines. While it takes years to explore and set up new lithium mines, *there is also* uncertainty about the sustainability of the lithium demand boom (Ext 5). This makes the expected ROR of the investment in lithium mining uncertain, limiting the rise in supply.
- Thus, the rise in supply should lag the rising demand, leading to price rise.

- In the very long run, technology for powering EV cars could have advanced such that demand for lithium would possibly then fall (Ext 5). Technology in mining lithium would also have improved (Ext 5). By then, the current investment in new mines, albeit limited, would also have boosted supply. Supply could possibly exceed demand, leading to surplus and hence price decreases.

Mark Scheme

L1	1-3	Descriptive explanation of demand and supply factors affecting lithium price and how change in demand and supply affects price
L2	4-6	Analytical explanation of demand and supply factors affecting lithium price and how change in demand and supply affects price (factors that lead to possibly rising price and possibly falling price).
E	1-2	Stand on the extent to which price will rise beyond is substantiated by judging the likelihood of demand exceeding supply in the short term and long term.

(f) **Discuss the case for and against the subsidisation of coal by governments of countries like China.** [10]

Intro

- A subsidy for coal production is the provision of finance by the government to coal producers to support the production of coal.
- The arguments for and against the subsidisation of coal by governments will be considered in terms of the impact on the governments' microeconomic goal of allocative efficiency and equity of distribution and the macroeconomic goal of economic growth

Body

FOR

1. Governments like China should subsidies coal **to help poorer households afford fuel, resulting in more equitable outcomes.**

   With reference to Fig 1, the subsidisation of coal lowers the marginal cost of producing coal from MPC to MPC', and consequently increases supply from SS to SS'. At initial price P, there will be a surplus. This leads to downward pressure on prices, and brings the market to the new equilibrium at DD = SS'. Prices will fall from P to P', and quantity sold from Q to Q'.

Since coal is China's main source of energy, coal is a necessity that powers basic needs like heating and electrical appliances at home (Ext 6 para 2). Hence, with subsidisation of coal, China will be able to keep coal prices low, and allow energy prices to remain affordable, and with keeping outcomes equitable *especially for poor households*. [L] This justifies the need to subsidise coal.

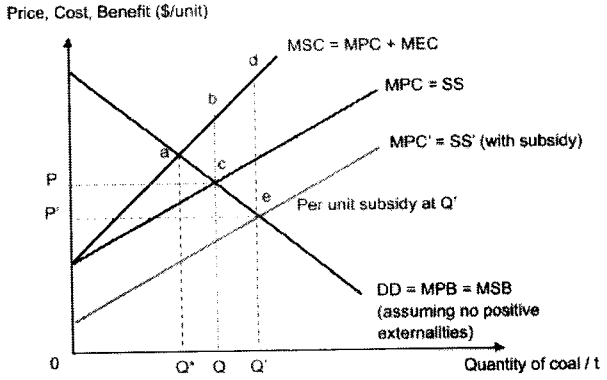


Figure 1: Per unit subsidy in the coal market

2. Subsidisation of coal enables China to **enjoy a higher rate of actual growth** from greater export price competitiveness

   With China's energy structure dominated by coal (Ext 7), the subsidisation of coal will reduce the price of energy and in turn, this will reduce the unit cost of production of goods and services. With reference to Fig 2, this increases aggregate supply and cause the horizontal AS curve to shift downwards from AS_1 to AS_2. As a result, assuming AD remains the same, the rise in AS will result in a fall in GPL from P_1 to P_2 and consequently, real national income will increase from Y_1 to Y_2 via the real balances effect, international substitution effect and interest rate effect. The international substitution effect is supported from Ext 6 para 2, that the cheaper goods and services improve the international industrial competitiveness of Chinese exports to overseas. With actual economic growth (from Y_1 to Y_2), governments like China are able to achieve its objective as it has placed economic growth as its priority (Ext 7 para 1).

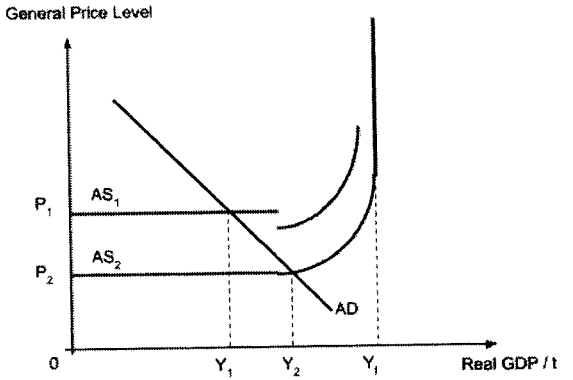


Figure 2: AD-AS diagram on China's use of coal as its main energy source

3. The subsidisation of coal allows China to **preserve its jobs in the coal industry**.

   For countries like China, the energy infrastructure is mainly denominated in coal power (Ext 7 Para 1). If China were to deprioritise coal as its main energy source, the quantity demanded for coal will decrease significantly. As a result, coal producing firms' demand for labour will fall. This causes a surplus of workers at the new equilibrium wage, which will fuel unemployment in the coal industry, as wages are downward inflexible and that workers are unwilling to take a lower wage.

   Thus, to protect jobs, China will need to subsidise coal.

   [Ev] Since the coal industry is the dominant energy source in China (Ext 7 P1), the impact on unemployment will be severe if China stops subsidising coal.

<u>AGAINST</u>

4. The subsidisation of coal will **worsen allocative inefficiency** by furthering escalating the negative externalities problem, and it also **prevents the attainment of sustainable growth**.

   The use of coal produces negative externalities, as explained in part (a), leading to allocative inefficiency. Since firms aim to maximise total profits, they ignore MEC and supply base on MPC. The free market equilibrium output is at Q where DD = SS. On the other hand, the socially optimal output is at Q*, where marginal social benefit (MSB) = MSC. This results in an overproduction of coal by (Q - Q*) units,

since for units between Q* to Q, the MSC incurred is greater than the MSB reaped, causing the welfare loss to be area abc.

With the subsidisation of coal by China, MPC falls from MPC to MPC', and causes SS to increase to SS'. This results in the new market equilibrium output to be at Q', where DD = SS'. With higher output, the subsidy results in even greater levels of overconsumption, now to (Q' – Q*) units and hence **greater welfare loss - the welfare loss to increase from area abc to area ade.**

Over time, living standards for future generations may decline as worsening environmental degradation from climate change leads to falling non-material living standards. This means governments are **not able to achieve sustainable growth** for future generations.

Since President Xi claimed that China will see its carbon emissions to decline from 2030 and laid the aim to achieve carbon neutrality by 2060 (Ext 7 P1), China should be considering to reduce the use of coal in the future. This supports the case against China to subsidise the use of coal.

Conclusion

In terms of economic theory, the 'case against' is strong whilst the 'case for' case is weak. However, considering the context of China, the 'case for' is strong too at least in the short term.

- While the need to improve equity of access to energy is arguable important, this goal need not be addressed via subsidies. There are other ways to helps HHs access fuel (e.g., transfer payments).
- Also, while removing the subsidies will cause the coal industry to contract, there are ways to address structural UN – e.g. skills retraining.
- Moreover, while coal subsidies can boost China's growth, it is at expense of non-material SOL. As a middle-income emerging economy, the population's valuation of clean air is on the rise.
- Thus, China should stop the subsidisation of coal.
- But China should not stop the subsidies immediately. Time is needed for China to build up alternative clean sources of energy. The lack of alternative sources of energy also means that using other methods like transfer payment to help poor households won't lower China's HHs' usage of coal anyway. Also, skills retraining of unemployed workers in the coal industry cannot be done overnight. Thus, case for subsidisation is still strong in the short term.

Mark Scheme

L1	1-4	Descriptive explanation of the arguments for and against subsidisation of coal. Max 4 if only considered either arguments for or against subsidisation of coal but the explanation is analytical and contextual.
L2	5-7	Analytical and contextual explanation of the arguments for and against subsidisation of coal. At least 1 argument for each side
E	2-3	Evaluates both arguments for and against and has a summative conclusion. Considers the context of the country
	1	Evaluates at least 1 argument.

Total **[30]**

Question 2

		Using Figure 1,	
a)	i)	**State and explain the relationship between Sri Lanka's exchange rate and standing deposit rate.** [1] – State the relationship [2] – Explanation of cause-effect between i/r & exchange rate There is a positive relationship [1] between Sri Lanka's exchange rate and standing deposit rate. This is seen from the depreciation of the currency and fall in interest rate from 2018 – 2020. This could be due to the outflow of hot money [1] from Sri Lanka as rate of returns fall with the fall in interest rates. Hence, supply for the LKR (rupee) rises, leading to the depreciation of the currency. [1] Or show a reduction of hot money inflow leading to a fall in demand of LKR	**[3]**

	ii)	**Explain how the change in Sri Lanka's exchange rate will affect its balance of trade.** [1] – Link to the impact of BOT [1] – Explain impact of depreciation on export revenue [2] – Explain impact of depreciation on import expenditure [1] – Explain impact on BOT (Not acceptable: 'increase', 'more positive', 'larger' and variations) *Answers that explain how changes to BOT will affect the exchange rate will not be accepted.* *Full credit can be awarded if answer explains how an appreciation of LKR will affect BOT.* A depreciation of the LKR (rupee) will lead to price of Sri Lankan's export to be relatively cheaper in foreign currency. [1] Demand for its export will rise corresponding rise in export revenue. [1] Price of its import will become more expensive in LKR, leading to a fall in quantity demanded for imports. [1] Assuming that $PED_M > 1$, import expenditure will fall. [1] With falling export revenue and rising import spending following the depreciation of the LKR, Sri Lanka's BOT, which is the difference between the value of export and import revenue, improves. [1]	[4]
b)	i)	**With reference to Table 3, describe the change in the countries' Trade Openness Index over the period 2018 – 2020.** [1] – Comparison of the direction of change All countries Trade Openness Index (TOI) fell over the period [1].	[1]
	ii)	**With reference to Extract 10, suggest and explain two possible reasons for the above change.** [2] For each possible reason that is explained. Reasons need to be based on Extract 10, address the fall in TOI across the entire time period (2018 – 2020) for the 4 countries. 2 out of the possible 3 reasons One possible reason is due to the increase levels of protectionism in the global economy (Ext 10, para 3). The imposition of import tariffs causes imported goods to rise in price, which incentivises residents to lower quantity demanded for imports (M). This causes fall in the level of exports by trade partner. [1] The trade partner will	[4]

		experience fall in GDP which in turn induces their residents to lower their demand for imports. This causes a fall in X for the country that imposed tariffs. [1] Thus import expenditure and export earnings fall for both parties, explaining the fall in trade openness index. Another reason is the trade war between USA and China. When these 2 countries impose trade barriers on each other's goods, the reduced trade flow between USA and China might reduce trade flows with between other countries as well since China's and US's real GDP might have been negatively affected by the trade war. [1] The lowered purchasing power leads to fall in imports by USA/China from their trade partners, leading to a fall in the TOI for their trade partners like Sri Lanka and SG. [1] Another possible reason might be due to the pandemic that led to firms and governments to localise their global supply chains (i.e. reduce off-shoring) in order to manage the supply shocks (Ext 10, para 1). [1] Hence, there is lesser need for countries to import components that were previously fragmented across the world, resulting in a fall in export and import values and the worsening of the TOI especially from 2019 – 2020, reinforcing the decreasing TOI trend. [1]	
c)		**Assess whether it is more crucial for Sri Lanka to reduce its balance of trade deficit or its fiscal budget deficit to improve its economic performance.** **Requirement 1:** Explain how the reduction of BOT deficit will improve economic performance (link to AEG, UnN) **Requirement 2:** Explain how the reduction of fiscal deficit will improve economic performance (link to AEG, UnN) **Introduction** Sri Lanka is currently facing a worsening trade balance deficit (Ext 8, para 1) and high level of fiscal debt (Ext 9, para 2). This will severely hamper its economic performance as it might lead to a fall in net export and worsening of confidence with the economy. Addressing both issues will lead to improvement for Sri Lanka's economic performance and we will consider the magnitude and persistence of the issue to weigh which issue will be more crucial to address. **Body** **Addressing the trade balance deficit could be more crucial to improve Sri Lanka's economic performance.** Measures such as joining the RCEP to address the trade balance deficit might improve the trade balance as it will improve the price competitiveness of Sri Lanka's exports when it trades with members of the RCEP. This could bring about a rise in net export (assuming that import expenditure rises at a slower rate than export revenue). With the rise in (X-M), its AD is expected to rise and via the multiplier effect, its RNY will rise with a decrease in demand-deficient unemployment. Overall, this can improve the economic performance of Sri Lanka.	[8]

[Ev] The improvement of Sri Lanka's BOT might lead to an appreciation of the LKR which in turn will make the price of assets in Sri Lanka to be relatively more expensive in foreign currencies. This could discourage FDI, leading to a fall in Sri Lanka's investment expenditure and the consequent negative economic growth impact.

Addressing the fiscal deficit will be more crucial to improve Sri Lanka's economic performance.

Addressing the high fiscal deficit in Sri Lanka can help improve investor's confidence in the economy as it will translate to a more stable economy where the government is able to better address future macroeconomic problems. This is when investors are more confident on the economic outlook of the economy, leading to the rise in expected rate of returns (EROR); marginal benefit of investment. Previously unprofitable investment projects are not profitable, and firms will increase their investment expenditure. This will lead to a rise in Sri Lanka's AD and a corresponding rise in real national income via the multiplier process. This will bring about a rise in demand for factor input as such labour as firms face an unplanned fall in inventory stock and via the multiplier process, Sri Lanka's RNY is expected to rise. Furthermore, if the rate of increase of capital stock exceeds the rate of depreciation, the production capacity of the economy might rise as well. This will bring about a rise in actual and potential economic growth and a reduction in demand-deficient unemployment, improving the economic performance of Sri Lanka.

Moreover, reducing the fiscal deficit can reduce the crowding out effect within the economy as it will reduce the amount that the government will need to borrow in order to finance future economic development fiscal spending. This will allow an increased ability of the government to conduct expansionary fiscal policies to stimulate economic growth and performance.

[Ev] However, Sri Lanka's effort to reduce its fiscal budget deficit will necessitate the reduction of government expenditure (G) and the increase of taxes (T). These measures will result in a contractionary impact on Sri Lanka's economic growth that hamper its economic performance.

Conclusion
[Stand] Addressing Sri Lanka's fiscal deficit will be more crucial to improve its economic performance in the short run.

The trade and FDI dependent nature of Sri Lanka's economy suggests that it is crucial to address both deficits. However, in order to make the structural changes discussed above in the economy, the Sri Lankan government will need to finance such changes either by fiscal spending or by FDI. Given the already high debt level, it will be more sustainable to attract FDI to finance the structural changes such as infrastructure spending. Hence, the need to improve the EROR by lowering the fiscal deficit is paramount in the short run for its economic performance.

Level	Descriptor	Marks
L2	Answer provides an analysis of how both the improvement of Sri Lanka's fiscal and trade balance deficit will improve its economic performance (economic growth & unemployment)	4 – 6
L1	Descriptive or incomplete analysis of how both the improvement of Sri Lanka's fiscal and trade balance deficit will improve its economic performance (economic growth & unemployment) OR Single sided analysis of how an improvement of either one deficit will improve Sri Lanka's economic performance	1 – 3
E	Evaluative comments/judgement with support of case materials that weigh which deficit is more crucial for the Sri Lanka's government Possible considerations (basis of comparison) 1) Links between the 2 types of deficits 2) Magnitude of deficits	1 – 2

d) **Using the case material and your own knowledge, discuss the extent to which deglobalisation will adversely affect small economies more than larger economies.** **[10]**

Requirement 1: Explain how 1 aspect of deglobalisation can adversely affect an economy with example

Requirement 2:
Explain how another aspect of deglobalisation can adversely affect an economy, with example

Approach: In general, there are 3 main flows of globalisation (trade, capital and labour). A compete and holistic answer will encompass the positive and negative impacts of at least 2 of the 3 flows of globalisation. A weighted conclusion to determine if small or larger economies will be affected is required for the full scope of Ev marks.

Introduction
Deglobalisation refers to the phenomenon when there is a reduction of the flow of goods and service, capital, and labour across international borders.

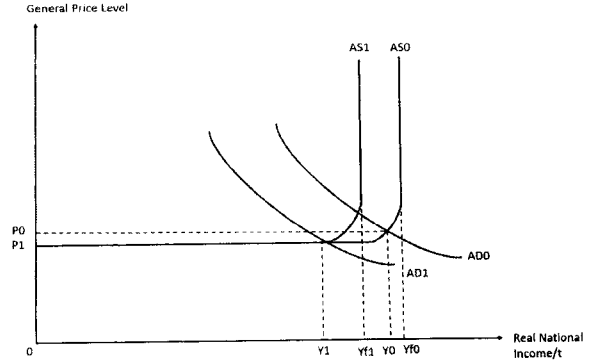
Body
1. Deglobalisation will affect economies' economic growth and employment negatively through reduced trade flow.

   Countries that depend on improving their BOT to achieve economic growth will be adversely affected through the reduction in the net export (X-M) value. As such, the decrease net export revenue (X-M) will result in a decrease in

aggregate demand (AD_0 to AD_1), leading to an unplanned rise in inventories as output exceeds expenditure. Firms then decrease their output and hire less factors of production (i.e. labour), consequently causing a multiple decrease in national income (Y_0 to Y_1) via the multiplier process and increase in demand-deficient unemployment.

Hence, deglobalisation might bring about negative economic growth at the worst or a slowing economic growth at the best.

[Ev] This might affect countries that are more trade dependent such as an emerging economy (which could be a large economy like China) that embraced export-oriented industrialisation or a relatively small domestic economy as trade will constitute a larger proportion are of their GDP such as Singapore relative to a larger economy such as the US.



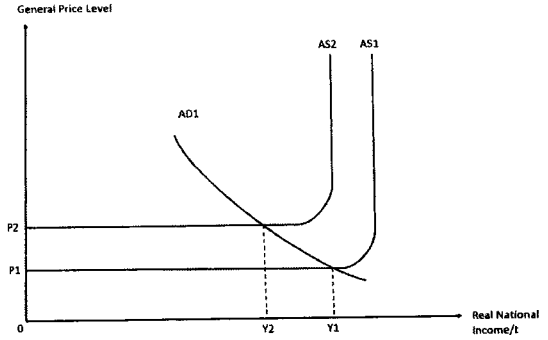
2. Deglobalisation will affect economies negatively through reduced capital flow.

Similarly, the reduction of capital flow across international borders will lead to a reduction of FDI and a corresponding fall in investment expenditure (I) within different economies. The effect of this fall in I is similar, as explain above, on AD. In addition, assuming that the fall in I will lead a fall in the level of capital formation (i.e. rate of capital growth is less than the rate of capital depreciation), the quantity of capital stock within the economy is expected to fall. This will lead to a fall in AS (from AS_0 to AS_1) and a consequent reduction in the productive capacity within the economy (from Yf_0 to Yf_1). This will inherently lead to the reduction of potential economic growth within the economy and limit the rate of future economic growth.

[Ev] This impact can be significant regardless of the size of an economy as seen in Ext 11. The dependence on FDI will determine the extent of impact through a reduction in capital flow rather than the size of the economy.

3. Deglobalisation will affect economies negatively through labour flows.

The reduce in international labour flows will reduce the ready pool of skilled and unskilled labour within an economy. This will lead to a fall in supply of labour and an accompanying shortage assuming that demand for labour remains constant. Hence, there will be upward pressure and a rise in wages at the new equilibrium. This will increase the unit cost of production (UCOP) within the economy and a fall in AS (an upwards shift in horizontal AS). Furthermore, the quantity of labour within the economy is expected to fall reducing the maximum possible output that it can produce. Overall, the entire AS curve is expected to shift left.



Firms will pass this rise in UCOP to consumers leading to a rise in the general price level from P1 to P2. In addition, through the wealth, international substitution and interest rates effects, consumption (C), investment (I) and export (X) expenditure will fall (represented as a movement along the AD from Y1 to Y2 until equilibrium is restored at a lower national output. Overall, deglobalisation in terms of reduce labour flow will bring about increased cost push inflationary pressure and possible reduction in actual and potential economic growth.

Conclusion:
[Stand] While we expect all economies to be negatively affected by deglobalisation, smaller economies will be more severely affected by deglobalisation relative to larger economies.

Smaller economies will tend to depend more on international trade and capital flows for economic growth. Larger economies that might have been dependent on exported-oriented industrialisation and FDI to drive their growth can rely on their sizable domestic sectors (C, G and domestic I) to buffer against the negative impacts of deglobalisation. Hence, with deglobalisation, assuming all other factors the same, the growth of smaller economies is expected to be lower than that of larger economies.

Hence, with deglobalisation, smaller economies will be more adversely affected than larger economies.

Level	Descriptor	Marks
L2	Answer provides an analysis of how deglobalisation will affect economies negatively, with appropriate economic tools of analysis. The answer should explain the impact of at least 2 flows of deglobalisation.	5 – 7
L1	Descriptive or incomplete analysis how deglobalisation will affect economies negatively, with some use of economic tools of analysis.	1 – 4
E	Evaluative comments/judgement with support of case materials that weigh which size of economies will be affected more from deglobalisation There must be an overall stand with substantiation using economic analysis and examples for max 3m	1 – 3

Victoria Junior College

2022 H2 Economics Prelim Exam Paper 2
Answers and Mark Scheme

Question 1

In 2020, the Singapore government distributed reusable masks to all households. It highlighted that besides protecting others, the wearing of face masks can protect oneself better from the spread of COVID-19. During that same period, Singapore saw rising sale of fake face masks which are sub-standard masks with ineffective filtration layers.

(a) Explain how consumer ignorance and asymmetric information could lead to an inefficient allocation of resources in the market for face masks. [10]

(b) Evaluate the alternative policies that can be adopted by the Singapore government to correct both these market failures. [15]

Part (a)

Approach

Students are to recognise that this is a question on cause and effects of two sources of market failure.

R1: How imperfect information leading to consumer ignorance will lead to market failure.
R2: How asymmetric information in the case of adverse selection will lead to market failure.

Suggested Answer

Introduction

When resources are allocated inefficiently in markets, market failure has occurred and this can be caused by imperfect information, where benefits or costs are over or underestimated and when once side of the market has more information than the other. In this essay, to simplify the analysis to focus on imperfect information, we will assume that there no externalities in the surgical face mask market to be analysed.

[P] One reason for market failure is consumer ignorance and this could lead to an inefficient allocation of resources in the market for surgical face masks.

[E+E] Consumers may lack full information on the benefits that can be obtained from consuming a good or service. For example, in the case of face masks, where some benefits such as increased protection from illnesses may not be immediately obvious, consumers may underestimate the true benefits that can be enjoyed from wearing an effective mask properly. As such, perceived marginal private benefit (MPB) from mask-wearing will be lower than true MPB (Fig.1). Consumers base their demand on perceived MPB. The demand curve thus reflects perceived MPB. Assuming no externalities, the true MPB equates the marginal social benefit (MSB), while marginal private cost (MPC) equates marginal social cost (MSC).

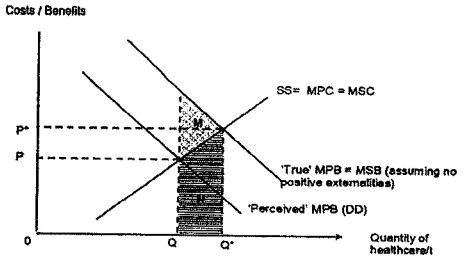


Figure 1: Market for face masks

[E+E] Left to the free market, market outcome will be where demand equates supply at output Q and price P (Fig. 1). However, socially optimal level of output where welfare is maximised is where MSB = MSC at Q*. There is thus underconsumption of surgical face masks because of consumer ignorance. For every unit between Q and Q*, MSB is higher than MSC; consuming one more unit thus adds more to total social benefit than to total social cost. The underconsumption of QQ* units thus lead to a welfare loss of area M.

[L] As such, consumer ignorance is one reason for market failure in the market for face masks when there is consumer ignorance.

[P] One other reason for market failure when there is information failure is the possibility of adverse selection.

[E+E] Adverse selection can occur when information between consumer and producer is asymmetric. One type of asymmetric information is where the sellers may have much more information than the buyers. This can happen in the market for disposable face masks. In the market, there would be both high quality disposable face masks (also known as "cherries") and poor quality face masks e.g. those with ineffective filtration layers (also known as "lemons").

The sellers of disposable face masks, know more about the quality of the masks they are selling (e.g. the effectiveness of the filtration layers used etc.) than do the buyers, who might not know of the filtration efficiency. The price that sellers are willing to accept is based on the quality of the masks which is known to them. The seller of a "cherry" is therefore prepared to sell the mask only if he is offered a high price. For a "lemon", he is prepared to accept a low price.

While a buyer would be willing to pay a high price for a "cherry" and a low price for a "lemon", the buyer lacks information on the standard of the disposable masks. As such, buyers would offer a price averaging the value of a "cherry" and a "lemon" for the masks (lower than for a "cherry", but higher than for a "lemon").

However, sellers of "cherries" would be unwilling to sell their good quality disposable masks for the average price and hence, would leave the market. On the other hand, sellers of "lemons" would find the price acceptable and be willing to sell their masks. With "cherries" leaving the market and more "lemons" joining, the average quality of masks in the disposable mask market will fall. This leads buyers to offer increasingly lower 'average' prices. More and more sellers of "cherries" would leave the market, and the market becomes increasingly concentrated with low quality masks. The 'average price' offered by less informed buyers drives the high quality masks from the market.

[L] This leads to market failure because the potential welfare to society that can be obtained from buying and selling high quality masks is lost.

Mark Scheme

	Descriptor	Marks
L3	Thorough explanation of why consumer ignorance and adverse selection can lead to market failure in the market for face masks. Provision of contextual examples and use of accurate and well-labelled diagrams.	8 – 10
L2	Underdeveloped explanation of two reasons why information failure can lead to market failure. OR Thorough explanation of only one reason why information failure can lead to market failure – Max 6	5 – 7
L1	Mere statements without explanation. Major conceptual errors.	1 - 4

Markers' Comments

SKILLS

Question interpretation

- The main shortcoming was failure by students to realise that the issue of asymmetric information in the content requirements of this question is about consumers buying poor quality face masks and a *complete analysis* of this phenomenon requires the application of the concept of adverse selection. This is because consumers might be fooled by false information provided by fake face masks sellers. But even after they learn that there is the possibility of being conned, consumers simply do not know which masks are poor quality and which are good quality and so only offer average prices leading to the adverse selection problem where the good quality masks market eventually disappear.

- There were students who explained that imperfect information led to consumption of poor quality masks and attributed this to supplier induced demand but they missed out on explaining the under-consumption of good quality masks due to ignorance about the true MPB of good quality masks.

  Learning point: For this question, analyse 2 types of market failure. i) under-consumption of good quality masks; ii) rising sale of poor quality (fake) masks

Analytical & Contextual Explanation (e.g choice of arguments, adequacy of rigour, choice of examples)

- While many scripts provided an accurate analytical explanation of market failure due to ignorance about true MPB, marks were held back by lack of contextualisation of the explanation - i.e. there was no explanation of what the consumers were ignorant about.

Learning point: Contextualisation of explanation shows application to context which wins you more marks.

CONTENT (Major misconceptions)

- Application of externalities in this question

  Correction: When the question is about imperfect information, the market failure is not about the disregard of positive externalities by consumers in decision making. The market failure due to disregard of positive externalities has to do with the *pursuit of self-interest.* Consumers know about the MEB but they do not include it in their decision making. Rather they only weigh MPB against price in their buying decisions.

  In other words, in the case of externalities, economic agents are self-interested and **disregard** the external costs or benefits in their decision making. Whereas, in the case of consumer ignorance, consumers are **ignorant** of the benefits/cost **to themselves.**

- Wrong identification of the welfare loss triangles

Part (b)

Approach

Students are to evaluate at least 2 policies to correct the market failure associated with consumer ignorance and adverse selection in the market for face masks. There will be a heavier-than-usual contextual requirement for this question as it is explicitly stated in the question, so the analysis must be backed up by real-world examples.

R1: Explain how a policy by the Singapore government could improve allocative efficiency in the case of consumer ignorance and adverse selection in the market for face masks.

R2: Explain how another policy by the Singapore government could improve allocative efficiency in the case of consumer ignorance and adverse selection in the market for face masks.

Evaluation marks:
Well-argued evaluative judgements should be made about the effectiveness of the various policies, taking into consideration the context of Singapore.

Suggested Answer

Introduction
One objective of the government is to achieve allocative efficiency, where resources are allocated in a way which maximises societal welfare. Consumer ignorance regarding the benefits of wearing face masks which leads to an under-consumption of masks, as well adverse selection, leading to an over-consumption of sub-standard masks will result in allocative inefficiency explained in part (a). As such, the government must intervene to correct these market failures in the form of public education as well as government provision. The policies can be evaluated based on certain criteria, such as the extent to which the allocative efficiency has improved, the fiscal sustainability as well as whether it leads to a trade-off with the micro-economic goal of equity. (Alt answers: strict regulations).

Body

Government provision

[P] Government intervention, such as free provision can lead to more efficient outcomes in the market for face masks when there is consumer ignorance.

[E+E] To encourage consumption in the case of information failure leading to underconsumption, the government may choose to directly provide face masks to all households for free. From the Figure 2 below, when P is now at 0, quantity demanded will increase from Q to Q', reducing the allocative inefficiency due to the under-consumption of face masks. For example, by the end of the Circuit Breaker in 2020, the Singapore government had rolled out multiple mask distribution exercises to all households, to encourage greater consumption of face masks. This was done in a bid to cope with the spread of the Covid19 virus during the pandemic then.

[L] Hence, government intervention in the form of free provision of face masks will increase consumption of the good, correcting the market failure associated with consumer ignorance.

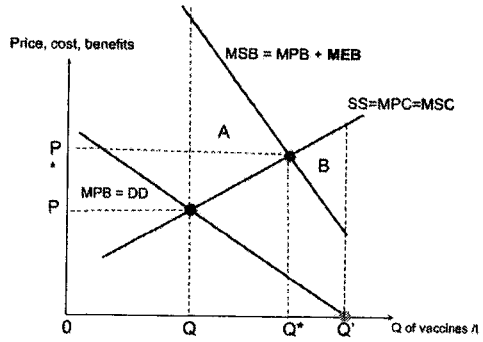


Figure 2: Government provision for face masks

[Ev] As information is imperfect in the real world, a government is likely to have difficulty in attaching a monetary value to the exact extent of imperfect information. In the worst case scenario, an over- estimation of the consumer's info gap can occur. This could lead to the government excessively proving a good for free to all households, leading to a greater welfare loss, if area B is greater than area A in Fig.2 above. Nevertheless, in the case of the pandemic, the market failure associated with information failure was too huge for the government to ignore, hence, various organisations like A*star were roped in to ensure that the masks provided were of excellent filtration qualities, to reduce the transmission of the virus.

[P] Free provision of face masks by the government can lead to more efficient outcomes in the case of an adverse selection problem.

[E, E] The government can ensure that Singaporeans are wearing good quality masks by distributing masks with effective filtration layers to all households. With each new distribution exercise that rolled out in 2020, the quality of the reusable masks improved too, ensuring that the households are well-protected. For example, the government contracted a hygiene technology company, Livinguard, for the fourth distribution exercise, which promised a water-repellent antimicrobial outer layer as well as an antimicrobial treatment in the inner layer. This helps to guarantee the accessibility of good quality masks that households should be wearing to safeguard themselves and others,

[L] improving the allocative efficiency outcome in the market for face masks.

[Ev] This improved equity too, as lower income households have access to good quality masks. Nevertheless, government provision of masks may not be sustainable if the pandemic persists. There is opportunity cost incurred and it may strain government's budget – increased spending in this area may mean less spending in other areas – e.g. less spending on education. This may result in welfare loss in other areas.

Public education

[P] Public education can improve the market outcome when there is consumer ignorance.

[E+E] In the case of surgical face masks, public education for example, through social media campaigns, works by educating consumers on the true benefits of wearing face masks. Campaigns will ensure that the public is made aware that the risk of transmissions of virus can be mitigated significantly if they were to wear effective face masks, properly. Demand for face masks will be rising as the gap between perceived MPB and true MPB narrows and consumers become more willing to consume face masks. With full information on the benefits of mask-wearing, the new demand now coincides with the true MPB, as shown in Fig.1. The new demand will now cut the market supply curve at Q*;

[L] market outcome is improved as welfare loss of rea M will be eliminated. This is because with government intervention, the socially optimal level of output is now being produced and consumed.

[Ev] However, consumers may not be responsive to public education, especially in the short run since it takes time for mindset and habits to change. As such, demand will not change very much and there will still be under-consumption of surgical face masks which mean that market failure may still persist.

[P] Public education can also improve the market outcome when there is adverse selection.

[E+E] Public campaigns may be used in cases of adverse selection in the market for disposable masks. For example, the government can roll out initiatives to provide consumers with a guide on how to check the bacterial filtration efficiency (BFE), which will give the wearer a more adequate protection from contact with droplets and sprays that may contain germs. An effective mask, or a "cherry", with a high BFE also filters out large particles in the air when the wearer breathes inAs such, informed consumers will be able to discern a "lemon" from a "cherry", and hence will offer a price befitting of an effective mask, preventing sellers of "cherries" from leaving the market.

[L] The market outcome will be improved as allocative efficiency increases. This is because with government intervention, the socially optimal level of output is now being produced and consumed.

[Ev] However, even if consumers are well-informed on how to choose high quality masks, there will be pockets of the society who would not be able to afford these "cherries". In some cases, they may still choose to consume "lemons" as the "cherries" could be beyond what they could afford, and they market for face mask will still be allocatively inefficient.

Regulations

[P] The Singapore government may also impose regulations to directly influence consumers' behaviour.

[E+E] For example, the government made it mandatory for face masks by everyone above the age of 2 to be worn at all times in public spaces. Individuals who flouted the rule by refusing to wear a mask were fined and recalcitrant offenders were prosecuted in court. By enforcing mask-wearing, this ensured that the optimal quantity of face masks was being consumed when there was consumer ignorance,

[L] correcting the market failure due to under-consumption in the market for face masks.

[P] Government regulations could also lead to better outcomes in the case of adverse selection in the market for face masks.

[E+E] By regulating the importing of masks (e.g. from approved mask producers only), local mask producers must meet certain standards and filtration capabilities before they are approved by the HSA to manufacture masks. This would therefore incentivise producers to produce high quality masks, and producers of fake masks will leave the market if they know that their sub-par masks will not be demanded since consumers are able to now distinguish between a "cherry" from a "lemon".

[L] Hence, the allocative efficiency in the market for face masks will improve with strict regulations imposed by the government.

[Ev] However, regulations require active monitoring and enforcement by the task force and legal teams, which would require the use of public funds and can be difficult to sustain in the long run. A frequent lack of punishment might lead to people flouting the rules more often and reduces the effectiveness of the policy in reducing consumption levels.

Conclusion

[Stand] With all things considered, public education by the government is the best policy to solve the problem of imperfect information in the market for face masks.

[Substantiation] This is because giving consumers more information will reduce the extent of information failure greatly and help them to make better choices. Even if the consumers are not very responsive to the campaign, any change in the demand closer to where demand would be should consumers have full information would mean market output is now closer to Q*, and there would be a smaller welfare loss.

However, this has to be complemented by other policies such as government regulation and free provision. Govt regulation is needed for more immediate impact in correcting the market failure since it takes time to educate the public. Free provision is needed because lower income households may not have the means to have access to these goods, even if they have perfect information on the true benefits of wearing it. However, there should not be continued free provision of face masks for all households. Since the education level of the Singapore residents is quite high, this means that left to market forces, the

under-consumption level is not that high. With the perceived MPB not being that much lower than true MPB, free provision is more likely to lead to greater welfare loss. Thus, free provision should apply only to residents who can't afford face masks.

It is also impractical to solely rely on public education to address the fake mask problem because even with knowledge of what constitutes a good / effective face masks, consumers will not know whether the sellers are being unscrupulous in hiding information about the poor quality of their masks. Government regulation of the producers is thus needed. With Singapore, being a relatively small country, the implementation of strict government regulations is also financially feasible.

Mark Scheme

	Descriptor	Marks
L3	A balanced and well-developed answer on at least 2 policies used by the Singapore government to address imperfect information in the market for face masks, with consistent use of examples.	8 - 10
L2	An under-developed answer on policies, with inconsistent use of examples and gaps in analyses. Some minor conceptual errors may be present which does not hinder overall analysis.	5 – 7
L1	An undeveloped answer where points are merely stated or listed without elaboration. May contain theoretical errors.	1 – 4
E3	Strong substantiation of stand, with at least two different considerations of how a policy could be better than the other, in the case of information failure, in improving market outcomes. Contextualisation using example(s) is provided.	4 – 5
E2	Some attempt at a conclusion or evaluation regarding the policies that governments can use to tackle the information failure in the market for face masks, but does not explain adequately their judgement or base it on analysis.	2 – 3
E1	Relevant stand without substantiation.	1

Markers' Comments

SKILLS

Question interpretation

- There were students who wrongly thought that the word 'alternate' in the question meant that the student had to consider policies that were different from the one mentioned in the preamble (provision of free masks). Actually, the word 'alternative' just means that the student needs to consider more than 1 policy for each of the problems.

Analytical & Contextual Explanation (e.g choice of arguments, adequacy of rigour, choice of examples)

- While a question on imperfect information does indeed suggest a need to consider 'public education', mere focus on this policy, together with regulation, tends to lead to a rather descriptive answer, making it hard to score in L3. **Learning point:** Thus, do be more strategic and bring in policies that are appropriate PLUS provides scope for much economic analysis - e.g. govt provision.
- Students must learn to save time. Don't waste time redrawing the 'imperfect info market failure diagram' when you merely want to point out that public education entails providing enough info such that perceived MPB moves closer to MSB. On the other hand, if you are explaining policies that require you to add new lines to the diagram, then, it makes sense to show the impact of the policy on a new diagram to reduce confusion for the marker when he/she marks part (a) (and for yourself too).
- In general, the explanation of how market-oriented policies work were not sufficiently developed. For example - students must go beyond just pointing out that a subsidy will cause SS to cut DD in a way that causes the equilibrium quantity to rise to the social optimum point. There is a need to explain how the subsidy works to impact the market price and in turn incentivise consumers to increase quantity demanded. Similarly, when explaining about free provision (where the government offers good quality mask at zero price), there should be an explanation of why quantity demanded rises to the point where the DD curve cuts the quantity axis.
- Many explanations were insufficiently contextual - one example was free provision. Many students did not try to explain what overconsumption would mean in this context - one reasonable meaning would be people wasting masks e.g. changing it often if it's a disposable one, taking more than they need, etc. Many did not even explain why the welfare loss from overconsumption could be greater than if nothing was done.
- Lemon law - while we did give some credit, this is not a good point to solve asymmetric information. Lemon law makes sense for products which are reasonably costly and you do not know of the quality at the point of purchase, e.g. a car, furniture looks fine at the point of purchase but breaks down after a while. But how would you know after buying the mask that it is of poor quality - it is often impossible to tell. So how you get a refund?

Evaluation

- The evaluative comment that the SG government has funds to finance its measures due to its large reserves is a weak comment because such a comment ignores the fact that these funds are finite and have alternative uses. As such, there is a need to consider the opportunity costs of the spending.
- The question calls for a judgment call on which policy is more effective in solving the 2 sources of imperfect info. Students merely explained the different policies and their limitations without comparing which policy is more effective in achieving allocative efficiency, and justifying why.
- Too many rehearsed arguments, especially the argument that education is the long-term solution. This is not at all true in the context of asymmetric information. It probably plays a role in that consumers know what to look out for, but it is impossible to tell whether a mask is of good quality. Education hence goes hand in hand with regulation in the case of asymmetric information.

CONTENT (Major misconceptions)

- Government reserves are not the same as government budget surplus. **Learning point** - government reserves (a stock concept) are the savings of the government that it accumulates from past years' budget surplus (a flow concept).

Question 2

Food in restaurants and hawker centers have risen with food prices at restaurants having increased at a faster pace compared to hawker food. Food vouchers for hawker centers have been issued by the Singapore government to help the lower-income households.

(a) Using the demand-supply model, explain why prices of food in restaurants rose at a faster rate compared to food in hawker centres when energy cost rose. [10]

(b) Discuss whether providing food vouchers is the best measure the Singapore government can undertake to address the rising price of food. [15]

Requirements for (a):
R1: Explain how the rise in energy cost affects the prices of food in restaurants and hawker centres.

R2: Explain why (difference in PED value and extent of impact) the rate of increase in food prices differ between restaurants and hawker centres as a result.

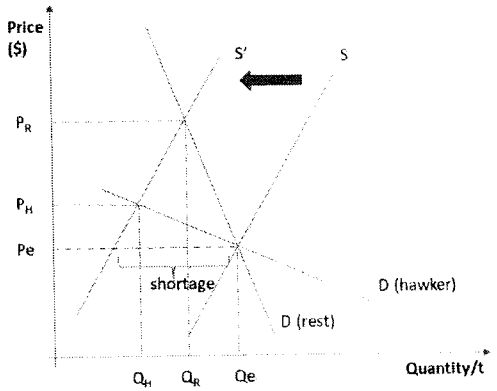
Suggested answer (a):

Introduction
The price of food in general can be analyzed using the demand-supply framework. Demand refers to the quantity of a good that consumers are able and willing to buy at various price levels during a given period. Supply refers to the quantity of a good that producers offer to consumers in a given period at a given price.

Body
[P] The rise in energy cost will lead to a rise in the price of food.
[E, E] The rise in energy cost affects all aspects of the food production process and will result in a fall in supply. For an additional unit of food produced, additional units of energy are needed to cook the food. Hence, the rise in energy cost leads to a rise in the marginal cost of production. When energy prices increase, ceteris paribus, the supply curve will shift upwards because for every unit that is produced, it now cost more to produce the same quantity. Thus, the supply of food will fall as illustrated in Figure 1 below, the supply curve will shift from S to S'.

Holding demand unchanged, this fall in supply will lead to a shortage at the initial price, Pe that creates upward pressure in price. Using demand curve, D(hawker), the fall in supply creates a shortage at the initial price, Pe. As price rises, producers are now willing to offer more units for sale at higher price levels. As the price rise, there will be a fall in quantity demanded as some consumers reduce their consumption at higher price levels. This adjustment continues until a new equilibrium is established.
[L] This process eventually leads to a rise in equilibrium price from Pe to P_H.

Figure 1. Fall in supply leads to a rise in price of food



[P] The difference in the price elasticity of demand for food in restaurants vs hawker centres leads to the difference in the rate of increase of food prices
[E, E] The demand for food in restaurants tend to be more price inelastic relative to the food in hawker centres. This is because there are more available substitutes such as fast food that are in the same price range for hawker-centre food compared to those provided by restaurants. Food in restaurants is usually produced by renowned chefs and has lesser substitutes in its price range.
In contrast, it is easier to find similar dishes in different hawker centres such as home-cooked food or fast food that are in the same price range. Hence, the demand for food in hawker centres tend to be more price elastic while that for restaurants is more price inelastic.

When there is a rise in energy cost, the supply curve for food will fall since it is now more expensive to produce each unit of food. As seen in Figure 1 above, the upward shift in the supply curve from S to S' leads to a more than proportionate fall in quantity demanded for food produced in hawker centres (from Qe to Q_H) while that for restaurants fall from Qe to

Q_R. This is because the less price elastic the demand, the greater the rise in price that is needed to clear the market.
[L] As such, the rise in price for food in restaurants is more significant than those produced in hawker centres.

Alternative response:
[P] The difference in the magnitude of shift in the supply curve for food produced in restaurants and hawker centres will also lead to a difference in the rate of increase in food prices
[E, E] In addition to the difference in PED value for the demand for food in restaurants versus that in hawker centres, the rise in energy cost will affect these two types of producers differently. Energy costs is a bigger percentage of total costs for restaurants because of the size of their operations. Restaurants need to provide dedicated seating and space for their patrons only while hawker centres make use of shared spaces for their customers. In addition, most restaurants are also air-conditioned that leads to higher operating cost. As such, restaurants will experience an upward shift in their supply curve to a larger extent compared to hawker centres, *assuming demand for restaurant food and hawker food have the same price elasticity.*
[L] Hence, food prices in restaurants will rise to a larger extent.

Conclusion
Given the relatively more price inelastic demand, an upward shift in the supply curve of a greater extent will result in food prices in restaurants rising more significantly than that in hawker centres. Since food in hawker centres have more available substitutes, its demand is more price elastic. Although its operating cost may rise when energy prices rise, the supply curve shifts upwards by a lesser extent.
In our analysis, we have assumed that the demand remains unchanged and all other factors are assumed to be constant.

Mark Scheme

Level /Marks	Descriptors
L3 8 - 10	Detailed explanation of how a shortage leads to a rise in price and how the difference in PED value affects the price of food in restaurants and hawker centres differently analytically.
L2 5 - 7	Cursory / descriptive explanation of how a shortage leads to a rise in price and how the difference in PED value affects the price of food in restaurants and hawker centres differently analytically. or Well-developed analytical explanation of how the **difference in PED value** for food between restaurants and hawker centres leads to a difference in rate of increase in price OR how the rise in energy cost leads to a shortage that results in the increase in price of food
L1 1 - 4	Shows relevant knowledge of how rise in energy cost leads to a rise in price of food in general (ie. DD-SS framework)

Markers' Comments

SKILLS

Question interpretation

- Some students interpreted the question without reading the stimulus – "energy cost rose". As a result, these students brought in demand factors such as 'an increase in income/affluence' and used YED concepts to explain why prices of food in restaurants rose at a faster rate than that from hawker centres. This was not relevant and very worrying, especially because many students who did so wrote quite a lot for this question, but their efforts ended up being futile.
- A few students used macro-analysis for this question despite the tool of analysis spelt out as "**demand-supply model**". These students explained that the rise in energy cost will lead to a fall in national income, and hence, demand for food falls (which completely contradicts the direction of the change in the price of food.
- Some students also talked about how a rise in energy costs would cause households to switch to eating outside instead of at home, so they will pay less for utilities, which is a very odd argument.

Analytical & Contextual Explanation (e.g choice of arguments, adequacy of rigour, choice of examples)

- Although many responses were able to use the concepts of shortage and PED differences, however, some of these answers were not able to explain that the reason for the faster rate of price increase for restaurant food is due to the larger extent of the rise in price to clear the shortage. A larger rise in price is needed because quantity demanded is not very responsive to a change in price, since the PED of restaurant is relatively more price inelastic.

- Some students interpreted the rise in energy cost as a leftward shift in the supply curves for restaurants and hawker centres to a different extent. They explained this based on the relative magnitudes of the supply shifts. If they used this explanation, theoretically, the demand curve must be assumed to be the same. Otherwise, the PED difference should be the main reason.

- Whilst most students could interpret the PED values correctly for both types of food, many had gaps in their explanation, e.g. the link to responsiveness in quantity demanded to show understanding of PED was not made.

- Also, a handful of students used incorrect examples when they highlighted the number and closeness of substitutes as a reason for the difference in the PED values for hawker and restaurant food. Many said that demand for hawker food is relatively price elastic because there are similar wide varieties of dishes sold by the different hawkers, which is evidenced by hawker food having many close substitutes. This example is flawed because hawker food is a broad category on its own. Examples of substitutes for hawker food would be food from other establishments, such as food sold in kopitiams or food courts. These food places do sell similar dishes as the hawkers, which can be considered as substitutes.

CONTENT (Major misconceptions)

- Weak responses could not explain that the rise in energy cost affects the marginal cost of production (shift the supply curve) and not the average/unit cost of production.
- Students who use the proportion of income spent to justify differences in PED between restaurant food and hawker food will find that it will yield an opposite result from what the question is asking for. Therefore, students need to be discerning about the points/factors they use and ensure that it answers the question correctly.

Part (b)

Discuss whether providing food vouchers is the best measure the Singapore government can undertake to address the rising price of food. [15]

Requirement for (b):
R1: Explain how food vouchers work to address the issue of rising food prices (ie. Improve inequity) and its limitations

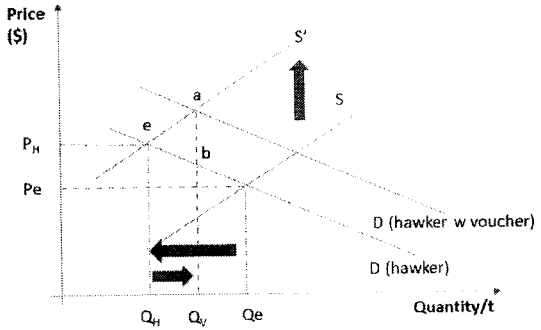
R2: Explain an alternative measure (eg. Subsidy to producers to mitigate rise in cost of production) that may be undertaken to improve the inequity caused by rising food prices and its limitations

EV: Provide comparison between food voucher vs the alternative in terms of the following:
- *Effectiveness of policy measure; extent of trade off (allocative efficiency)*
- *Context of Singapore (food constitute a large proportion of households' incomes) that affects inequity*
- *Cause and duration of rise in energy cost that affects fiscal sustainability*

Suggested answer (b):
Introduction
Rising food prices affect all households in Singapore. To address the impact of rising food prices, the Singapore government can provide food vouchers such as those CDC vouchers households to help defray the rise in food cost. Alternatively, the Singapore government can also provide subsidies to producers to help mitigate the rise in energy cost, leading to lower production cost and thus, food prices.
To do so, the Singapore government will also consider the effectiveness of measures undertaken to solve the problem, its ability to fund and sustain these measures and possible trade-offs such as allocative inefficiency.

Body
[P] The provision of food vouchers can help lower-income households cope with rising food prices.
[E, E] Food vouchers such as the CDC vouchers could be given to all households during the period when food prices are rising. This is to ensure that households continue to be able to afford food necessity. These vouchers can then be used in most hawker centres but not for restaurants. The aim is to help the lower-income households who frequent hawker centres.

Figure 2. How vouchers mitigate the fall in supply



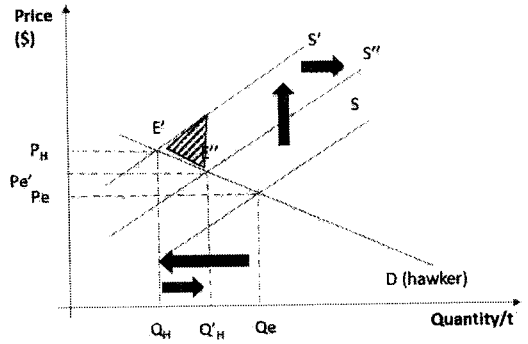
As seen in Figure 2, the rise in energy cost has resulted in a fall in quantity demanded for food in hawker centres from Qe to Q_H as prices rise from Pe to P_H. The provision of food vouchers will result in a rise in demand for households from D (hawker) to D (hawker w voucher) because these vouchers are equivalent to cash that can be used for the purchase of food.
[L] Hence, we can see that the rise in demand due to the food voucher has resulted in a rise in quantity of food from Q_H to Q_V.

[EV] Assuming market was initially efficient, the fall in supply would have led to a market outcome at equilibrium point e where the price is P_H and quantity is Q_H. The implementation of the voucher would increase consumption to Q_V, that leads to welfare loss of area eab. The larger the amount of voucher given that raised consumption, the larger the welfare loss area.

[EV] The value of food vouchers needs to be sufficiently substantial to make a significant difference to help improve their access to affordable food. As such, the funding requirement for this initiative can be challenging, especially if there are fiscal constraints faced the government. In addition, there may be other trade-offs when the government decides to prioritize spending in this undertaking that may affect other areas of fiscal spending.

[P] The Singapore government can also provide subsidies to food producers to reduce the price of food.
[E, E] A subsidy that is given to food producers will lead to a downward shift in the supply curve. This is because for each unit of food produced, the subsidy will reduce the cost of producing that additional unit.

Figure 3. Subsidy to producers increases quantity demanded



As seen in Figure 3, the subsidy will shift the supply curve from S' to S", mitigating the upward shift caused by the rise in energy cost (S to S'). This subsidy will result in a new market equilibrium at point E" where the equilibrium price is Pe' and quantity demanded is Q'_H. While the consumption level is still lower than Qe, it is now higher than that without subsidy.
[L] Hence, a subsidy is able to help households increase some of their consumption through the lowering of price of food.

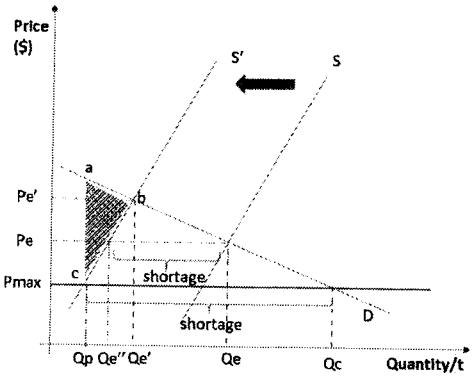
[EV] Assuming no externalities and so Q_H is socially optimal, the subsidy leads to over-production by $Q'_H - Q_H$ units, leading to allocative inefficiency. As seen in Figure 3 above, the subsidy has resulted in an artificially lowered marginal cost, S" compared to the true marginal cost, S'. As such, there will be a welfare loss of the shaded triangle because of the allocation of resources to lower the true marginal cost.

[EV] Such subsidy would have a heavy burden on the government especially if the rise in energy cost is substantial.

[P] A maximum price may also be used to reduce the price of food.
[E, E] A maximum price is set below the market equilibrium price. It is the highest price that producers are legally allowed to charge in a market. As seen in Figure 4 below, the rise in energy cost shifted the supply curve from S to S' has created a shortage of Qe – Qe". As a result, the new equilibrium price will rise from Pe to Pe' and new equilibrium quantity from Qe to Qe'.
Let us assume the maximum price is now set at Pmax. Doing so will help to lower the price of food.
[L] As such, a maximum price is able to lower the price of food.

[EV] However, such price control measure leads to shortage. At this price, consumers will be willing to consume up to Qc. This is because the lowered price will increase the quantity demanded for food. However, producers of food are only willing to offer Qp because the lowered price will also lower their willingness to offer more for sale. Hence, a greater shortage of Qp-Qc is created. Assuming the market to be efficient, the production of only Qp units, which is an under-production in relation to the socially optimal level of Q_H (assuming no externalities) leads to welfare loss of the shaded area abc. This policy also creates other problems in the distribution of it. In this case, an appropriate allocation system will need to be present to ensure the poor also have access to food. Without perfect information, it will be difficult to ascertain what level to impose the maximum price.

Figure 4. How a maximum price work



Note: Any other measure that can bring about a rise in consumption level can be accepted Eg. Subsidy on process innovation that leads to lowering of cost of production)

Conclusion/Evaluation

[Stand] While the provision of food vouchers has its limitations, it is a better measure than production subsidies.

The provision of food voucher alone is not the best method to deal with rising food prices. There are other measures that may be used.

[Substantiation] Food voucher provision can be more targeted at the lower-income households despite the fixed-dollar amount may also not be sufficient to offset the rising cost of energy prices that food producers are able to pass on to consumers. The dollar value of these vouchers can be graduated such that the lower the income levels, the higher the dollar value is given. As such, it can also be more fiscally sustainable.

Although various forms of government intervention will lead to misallocation of resources if market was initially efficient, a production subsidy may reduce the incentive to minimize cost by producers. Price ceiling would be even worse because it not only leads to allocative inefficiency but also greater shortages over time.

The ability of the government to finance these measures depend on the size of funding needed and the duration of the need to do so. If the rise in energy cost continues indefinitely, the Singapore government will face a challenge to fund such assistance to help the poorer households mitigate the rise in food prices. Thus, the long-term solution is to boost households' incomes for a more sustainable solution to rising food prices.

Mark Scheme

Level / Marks	**Descriptors**

L3 8 - 10	Well-explained theoretical analysis of food voucher and **at least one other appropriate alternative method** that is **supported by examples** and **diagrammatic illustration**.
L2 5 - 7	Analysis that has some gaps in explanation (cursory explanation) and lack examples to illustrate. Max 6m: For a well-explained answer on any measure that can help households tackle rising food prices (include limitations) without offering any other alternative.
L1 1 - 4	Some attempt to answer the question without any examples or application of how food voucher can help households or answers that contain obvious flaw in theory.
E3: 4 - 5	For an answer that demonstrates contextual analysis (eg. Singapore's case) and able to weigh the pros and cons of the alternative method(s) (eg. demonstrate knowledge of the limitations for different types of measures) in the conclusion, to support the stand. There is a summative conclusion.
E2:2 - 3	For an answer that makes some an attempt to support the evaluation or conclusion or Only in-body evaluation with no summative conclusion
E1: 1	For unsubstantiated conclusion.

Markers' Comments

SKILLS

Question interpretation

- Many students missed out the portion of "rising prices" in the question. Most of them only drew a diagram to show the impact of a policy, with no reference to the initial trigger of rising prices in their diagrams (i.e. they need to show how the proposed policy measure can resolve the initial rise in price caused by the rise in energy cost).

Analytical & Contextual Explanation (e.g choice of arguments, adequacy of rigour, choice of examples)

- Most students did not assume that the market was initially efficient (i.e. rise in energy cost that translates to an increase in price and fall in quantity demanded are all based on market forces, and hence there is allocative efficiency). This means that the answer would have missed out on the analysis that a government policy measure to intervene in the market could result in welfare loss to society (allocative inefficiency).
- Many scripts lacked rigour in explaining R1 (i.e. how food vouchers work to address the rising price of food). Besides not addressing the "rising prices", many explanations were descriptive in nature and did not use tools of economic analysis.
- Students also need to be mindful of the **problem that needs to be solved** and ensure that their explanations end up addressing the problem. For instance, for this question, many students explained that food vouchers made food more affordable and stopped there. However, there needs to be recognition that the food vouchers

would be given out to lower-income households, so the increase in affordability of food only applies to them.

Evaluation

- Most of the evaluations were superficial – e.g. when the government provides subsidies and vouchers, there will be opportunity cost involved, or it will strain the government fiscal budget, or a maximum price will worsen the food shortage.
    - For example, in evaluating the appropriateness of food vouchers, quite a number of students talked about how the demand for food will increase as a result of the food vouchers, and hence the price of food would rise again. Students will need to go on to explain what is so bad about the rise in price. Firstly, the rise in price does not adversely affect the beneficiaries (lower-income households who receive the food vouchers). Instead, middle to higher-income households would thus face an increase in the price of food.

- The question clearly required some form of comparison between the strength and weaknesses of proposed policy measures to substantiate the stand made. For example, a comparison can be made between the welfare loss from using vouchers versus the welfare loss that emerges from the subsidies or the implementation of the maximum price (price ceiling). Students may also consider the ease of implementation or short-term impact of the policy.

- Most of the evaluation was also not contextualised to Singapore. Given that the proportion of low-income households is relatively small in Singapore, the food vouchers given to these households may be more effective than a blanket subsidy to tackle the unaffordability issue. Also, students should not just point out that Singapore has high reserves and may be able to afford to carry out a particular measure. Instead, the context of the question/nature of Singapore's economy should be considered, e.g. how sustainable are the policy expenditure if energy costs keep rising and the need for the budget to be allocated to healthcare policies for our ageing population.

CONTENT (Major misconceptions)

- A few students explained that food vouchers are a way to reduce MPC and increase the supply of food. This explanation is incorrect as vouchers increase the ability of consumers that receive the vouchers to buy food. The increase in food consumption by lower-income households through these vouchers should relate to the increase in demand for food.
- Note also that vouchers will not reduce the price of food for lower-income households, nor will they increase their disposable income.
- Quite a number of students attempted to explain subsidy on food as a means to reduce allocative inefficiency, i.e. they assumed there were positive externalities from food consumption, which is flawed. Such students also drew diagrams that show a divergence between MPB and MSB, although this was not explained most of the time. In any case, there are no positive externalities involved in this question, and the government would only be intervening for equity reasons.

Question 3

Nike is the market leader in the global sports footwear industry. Nike's business strategies include building its brand through sports celebrity endorsements, developing products that have high-quality, market-leading technology and acquiring competing sports brands.

(a) Explain two ways in which a profit-maximising firm like Nike could benefit from acquiring another firm in the same industry. [10]

(b) Discuss the view that governments should stop firms from acquiring other firms in the same industry. [15]

Part (a)

Approach

Students should explain the two ways that firms can benefit from an acquisition of a firm in the same industry (i.e. horizontal integration). Acquisitions allow firms to benefit from (i) cost savings arising from producing at a larger scale, and (ii) charging higher prices due to greater market power.

R1: Explain how the acquisition of another firm in the same industry can lead to cost savings that boost total profits

R2: Explain how the acquisition of another firm in the same industry can lead to higher TR that boost total profits.

Outline

Introduction

An acquisition refers to the situation when a firm buys out and takes ownership of another firm. Firms may decide to acquire another firm in the same industry to pursue cost savings and/or increased market share, with the underlying motive of maximise profits.

Body

[P] Acquisitions can benefit a profit maximizing firm as it can lead to cost savings arising from greater internal economies of scale

[E, E] The increased scale of production from the acquisition may lead to greater scope for reaping internal EOS, which refers to fall in AC arising from increased scale of production of a firm. For example, Nike had acquired another sneaker company Converse. This may allow Nike to utilise bigger capacity machines or warehouses for distribution. Total cost may increase less than proportionately to the increase in output produced. This is as the firm only needs a less than proportionate increase in number of workers to operate larger capacity machines or when the storage volume of the warehouses rises more than in proportion to their building costs, due to cost savings with increased scale. This allows the firm to enjoy lower average cost of production.

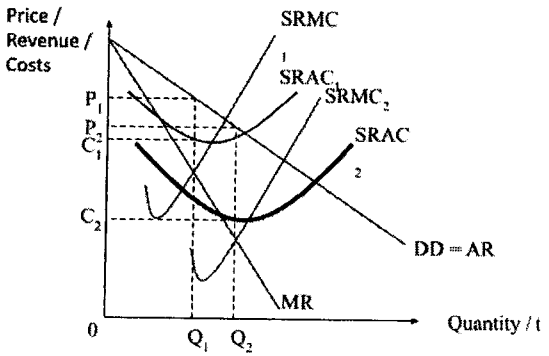


Fig. 1 – Effect of lower cost from EOS on firm's profits

With reference to Fig 1, before the acquisition, the firm would set its output at Q based on the profit-maximising condition of $SRMC_1$=MR, and charge a corresponding price of P. After the acquisition, the firm now operates with a bigger plant with SRAC and SRMC curve represented by $SRAC_2$ and $SRMC_2$. When the MC is lowered, the profit-maximising firm now finds that MR exceeds MC and adjusts its output to Q_2 where MR cuts $SRMC_2$. As AC is lowered, the firm is able to sell its products at a lower price (P_1 to P_2) and is thus more price competitive. [L] Profits increase from $[(P_1-C_1) \times Q_1]$ to $[(P_2-C_2) \times Q_2]$ due to the cost savings.

[P] Acquisitions can benefit a profit maximizing firm as it can lead to higher revenue and hence higher profit earned by the firm due to greater market power
[E, E] Market power, also known as monopoly power, refers to a firm's ability to influence the market price of the good it sells. The higher the firm's market power, the greater the firm's ability to influence the market price. By acquiring another firm (e.g. Converse) in the same industry, Nike can now capture a larger market share as the customer base from both firms are now combined, which leads to higher demand for the firm. Demand for the firm's products also becomes less price elastic as consumers now have fewer substitutes to switch to.

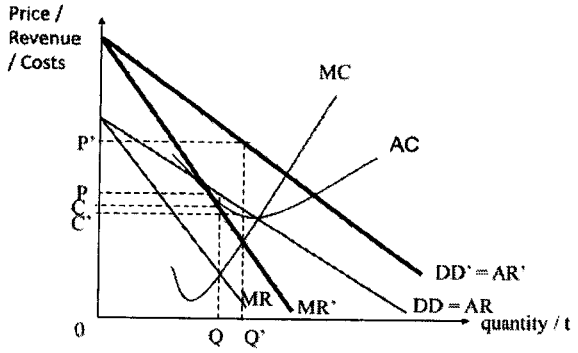


Fig. 2 – Effect of larger market share on firm's revenue

With reference to the diagram in Fig. 2, before the acquisition, the demand curve and MR curve for the individual firm would resemble DD and MR respectively. The firm would then set its output at Q based on the profit-maximising condition of MC=MR, and charge a corresponding price of P. Assuming similar costs, with the acquisition, the firm now has a demand curve which resembles DD' and hence an MR curve which resembles MR' as it faces a higher level of demand and demand for its services is less price elastic.

As demand increases from DD to DD', the firm will adjust its output to where MR'=MC. Price and output sold increases to P' and Q' respectively, **leading to higher TR** which is price multiplied by quantity sold. Profits therefore increase, assuming the rise in TR is greater than the rise in TC.
[L] The acquisition can allow the firm can enjoy higher profits, from [(P-C) x Q] to [(P'-C') x Q'].

Mark Scheme

Level	Descriptors	Marks
L3	Well-developed analytical explanation of both ways (EOS **and** higher market share) an acquisition can help to increase profits. The tool of analysis used is the process of profit-maximisation (initial MR=MC and final MR=MC), with diagram(s). Tool of analysis must be used attain an "analytical" band.	8-10
L2	Underdeveloped and cursory explanation of both ways (EOS **and** higher market share) an acquisition can help to increase profits. OR Analytical explanation of only one way (EOS **or** higher market share) an acquisition can help to increase profits. (Max L2 - 6)	5-7
L1	Mere statements without explanations OR explanations contain major conceptual errors.	1-4

Markers' comments:
SKILLS
Question interpretation
- Many students interpreted the question as "merger" rather than "acquisition". While the content is similar, these are different forms of horizontal integration, students need to be accurate to the context of the question.

Analytical & Contextual Explanation (e.g choice of arguments, adequacy of rigour, choice of examples)
On EOS and cost-savings
- For the point on internal EOS, students tended to have gaps or misconceptions in the following:
  1. Students only drew a LRAC curve without revenue curves to show costs fall. This explanation only illustrates iEOS, but does not explain how profits rise.
  2. Students only drew (SR)MC curves falling, with no (SR)AC curves drawn in their diagrams. Profit levels (e.g. [P - AC] x Q) cannot be shown without AC curves.
  3. For students that drew only (SR)AC falling without a fall in (SR)MC, it is conceptually correct. However, it will lack economic rigour in that it is not

possible to explain how the profit-maximising condition changes without a change in MC.

- For those who did explain how the gain in EOS allows the firms to earn higher profits, there were many that incorporated examples to illustrate this concept. However, the examples were merely listing of how specialisation of labour or capital helps the firm to achieve greater EOS. Most did not use their examples to explain the idea of cost savings for the firms. For example, by having specialised workers which lead to higher productivity, more output can be generated and hence the cost of hiring them can be spread over a larger output level; and the firm is able to lower its unit cost of production. They should also give examples of firms that Nike can buy over, to show the awareness of the context instead of just saying 'other firms'. Also, the concepts of indivisibilities of capital and the principle of increased dimensions are distinct, but some treated them as one as the same.
- Some students have missed out on cost-side benefits of internal EOS and instead explained an indirect explanation of how higher profits from higher market share allows the firm to carry out cost-saving strategies such as process innovation. As this impact is indirect, it will not be considered for full credit.

On increasing market share

- Many students concluded that the rise in market share from acquisition would lead to a monopoly market structure. This is not always true, as it depends on the firms/industry involved. Instead, the student should use this as an evaluation angle in (b), that a resultant monopoly market structure can be highly detrimental, as compared to a resultant oligopolist/monopolistically competitive market structure.

On profit-maximisation

- Some students used one diagram to show both effects (increasing market share and internal EOS). While valid, it must be carefully analysed. A number of these students identified the wrong initial and/or final profit-max conditions, and subsequently identified wrongly Q, P or AC levels, and hence profit areas.
- Students that did not score full credit for analysis tended to miss out on explaining the **initial** and **final profit-maximising conditions (where MC=MR)** using the diagram.

CONTENT (Major misconceptions)

- Some scripts wrote AC as actual cost. This is not correct. AC refers to average cost, and there is no specific term called actual cost.

Part (b)

Discuss the view that governments should stop firms from acquiring other firms in the same industry. **[15]**

Approach

*To discuss the view that governments should stop firms from acquiring other firms in the same industry, students need to consider the **pros and cons of acquisitions** based on government's microeconomic objectives of **efficiency and equity**. As the question does not specify the industry chosen, students can evaluate the view based on the nature of different industries.*

R1: Explain at least 1 reason why governments should stop firms from acquiring other firms in the same industry

R2: Explain at least 1 reason why governments should not stop firms from acquiring other firms in the same industry.

The judgment will require weighing the arguments for and against by considering the type of industry, with examples.

Outline

Introduction

Governments examine the pros and cons when it stops a firm from acquiring another firm in the same industry, based on the **impact on society as a whole, considering the impact on efficiency of resource allocation, rate of innovation and equity.**

Body

Arguments for government stopping acquisitions

[P] Governments can prevent the combined firm from abusing its higher market power, which can lower allocative efficiency and consumer surplus.

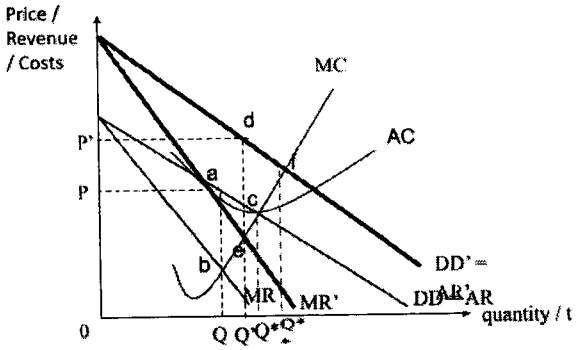


Figure 3 – Showing allocative inefficiency before and after acquisition

[E+E] The acquisition result in increased market power and hence greater welfare loss. With reference to Figure 3 above, **before the acquisition**, the welfare loss is represented by area abc. This welfare loss is due to underproduction since for the units between the initial profit maximising output level, Q, and the allocative efficient level, Q* (where DD cuts MC), **P>MC.** This means **society values each of the units more than the MC of producing it yielding a net gain for society.** By not producing those units, society lost the potential gain in welfare of area abc.

After the acquisition, the new price is higher at P', which creates a larger divergence from the allocative efficient price level (P' > MC at Q**), and consequently the welfare loss is represented by area def. The underproduction now is larger, between output Q' and Q** units (the new allocative efficient level is at Q** where DD' cuts MC). This area of welfare loss def is now bigger than the initial area abc. [L] This results in greater allocative inefficiency.

[E+E] Consequently, with higher prices, consumer surplus falls. Consumer surplus is defined as the difference between the price that households are willing and able to buy goods at and the price they actually pay. Assuming that the demand curve for the market remains the same, the higher price causes the consumer surplus to be lower.

[P] Governments should stop acquisitions as it may prevent greater inequity in distribution of goods and services

[E+E] As the expanded firm enjoys greater market share, it will face a higher demand as the firm captures a larger share of market demand. The firm will also have a more price inelastic demand as there are now fewer firms in the market after the acquisition, which means there are fewer substitutes available. As a result, **consumers are now charged a higher price** of P', while **firms enjoy an increase in profits** from [(P-C) x Q] to [(P'-C') x

Q'], as seen in Fig. 2 in part (a). **[L]** This worsens inequity of income distribution between consumers and shareholders of the firm, who are presumably more affluent members of the society. A more unequal income distribution will lead to greater inequitable access to goods and services.

Arguments for allowing acquisition

[P] Governments should allow acquisitions if the firm can reap cost savings due to economies of scale, which enable domestic firms to be better able to compete against foreign firms.

[E] As mentioned in (a), the increased scale of production from acquiring another firm can lead to greater scope for reaping **internal EOS** which refers to the fall in **AC** arising from increased scale of production of a firm.

[E] For example, Nike acquiring Converse can allow for streamlining of their production line to manufacture sneakers at a cheaper cost (e.g. assembly lines can be shared, shared technologies between Air Jordan and Converse basketball sneakers). **[L]** These cost savings can help the firm charge a competitive price in the global market and able to compete against foreign firms which may also have a large EOS due to their high level of output.

[E+E] Consequently, if firms are willing to pass on these cost savings to consumers, consumers now can buy more footwear at lower prices, and enjoy higher consumer surplus.

[L] Since consumers welfare improves, governments should allow acquisitions.

[Ev] However, if firms like Nike instead face diseconomies of scale, the higher average costs may result in worsened outcomes for society. For example, since Nike is already one of the largest firms in the sportswear market with a global presence, additional horizontal integration may result in greater challenges in communication between managers and employees, or more challenging coordination efforts when Nike is employs strategies (e.g. advertising will need to be targeted to the country's tastes and preferences). These increased costs might be undesirable for a society if Nike were to pass on these costs to consumers, and instead worsen consumer surplus instead.

[P] Government should allow for acquisitions because the profits earned can be used to spur more innovation and improve dynamic efficiency.

[E+E] From (a), acquisitions can benefit firms to earn more profits through reaping economies of scale from $[(P_1-C_1) \times Q_1]$ to $[(P_2-C_2) \times Q_2]$ in Fig. 1 and increasing market share from [(P-C) x Q] to [(P'-C') x Q'] in Fig. 2. With a higher demand and lowered costs, the firm can earn more profits, which are crucial for a firm like Nike to sustain research and development (R&D).

[E+E] Since R&D tends to be costly and inherently risky with uncertain results. With increased profits earned, firms have greater ability to undertake investments in R&D. For example, Nike has been undertaking innovative efforts in multiple areas, creating the Nike Zoom Vaporfly to set new world marathon records and using augmented reality (AR) for consumers to experience their newest shoe offerings. This form of product innovation can enhance dynamic efficiency as consumers get to enjoy better quality products.

[E+E] Moreover, process innovation such as adopting automation technologies to assemble footwear can help to lower variable costs, which lower MC and AC. This causes Nike to raise output levels at a new profit maximising output since MR is now greater than MC. This lowers price as a result, and consumers now benefit more as they receive higher consumer surplus, and **[L]** improves society's welfare over time.

Other possible points

[P] Governments should stop acquisitions as it may lead to X-inefficiency

- Acquisitions lead to decreased competition which can lead to complacency – i.e. the firm doesn't do its best to produce at least cost

Conclusion

[Stand] Whether governments should stop firms from acquiring other firms from the same industry depends on the significance of the impact on abusing market share vs reaping cost savings from EOS.

Governments **should allow acquisitions** if it is likely to lead to cheaper prices for consumers or be willing to innovate to improve dynamic efficiency. However, governments **should stop acquisitions** if firms are seen to abuse their increased market power.

[Substantiation] To judge whether the acquisition should be allowed, the government has to consider the **extent to which market power will be increased.** Also, whether the **price** is likely to rise or fall, which entail considering the extent to which the acquisition will result in **increased opportunity to reap internal EOS**. The **type of good** in question is also an important consideration – e.g. whether the good is a merit good / demerit good.

**Note – the Evaluation angles are non-exhaustive, and the intent is to show how one can conclude differently based on different contexts, and to complement the tools of analysis used.*

[Ev angle 1*: Depends on firms' willingness and ability to innovate] For the case of the sports footwear industry, governments **should allow Nike to acquire another firm.** The acquisition allows Nike to intensify its R&D efforts to greatly improve dynamic efficiency. As Nike is a world leader in sportswear making, it has created better quality products to help athletes perform better through cushioning technologies like Nike Zoom Fly and React. By acquiring another firm like Reebok, Nike will be able to amalgamate its technologies to improve sportswear in other fields (e.g. Cross training), and further offer consumers higher quality choices over time and improving dynamic efficiency. Allocative inefficiency, on the hand, will likely not increase as much, since sportswear production is labour-intensive causing the minimum efficient scale to not be high, and thus there are many smaller firms like Decathlon who can contest the market to produce at a competitive price. Hence, Nike will likely keep its prices down at a reasonable level for consumers to afford, for its mass market range.

[Ev angle 2: Depends on the firms' strategies post-acquisition] On top of that, Nike may be able to confer positive externalities to society if more consumers use their sportswear and health tracking applications for exercise. For example, by acquiring another firm, Nike earn higher profits and be more able to advertise Nike+ Run App to existing fitness trackers like the Apple Watch and Garmin fitness trackers. Through a better-quality product, consumers be spurred to exercise more, and improve their cardiovascular health, and in turn confer third party benefits (MSB>MPB) through higher labour productivity in the workplace. This is in line with the Singapore government's push for a healthy lifestyle, where Health Promotion Board had partnered with private firms like Apple to gamify fitness tracking through Lumihealth, a game that rewards consumers when they track exercise on the Apple Watch. Thus, this might overall be more beneficial for society, and is a reason why governments should allow acquisitions to occur.

[Ev angle 3: Depends on nature and type of good: Merit goods] For the case of hospital services, the increased opportunity to reap EOS from increased scale of production is not extensive due to its nature of more personalized service and human capital intensity in production. This means an acquisition of another hospital is more likely to bring about exploitation of market power rather than EOS. This benefits the producers rather than the consumers (since price is likely to end up higher than lower). In fact, consumers are more likely to end up worse off. Moreover, as this is a necessity, the implication for inequity of distribution is serious. Moreover, hospital service (which can include the health screening services) can be regarded as a merit good by society. Such a good is already

under-consumed in a competitive market. The increased market power will worsen the under-consumption of such a good. By not allowing the acquisition however, the potential benefit of increased R&D is sacrificed. But this problem can be reduced if the government funds R&D in medical care.

Mark Scheme

Level	Descriptors	Marks
L3	A balanced discussion, with well-developed explanations of why governments should stop **and** allow acquisitions, using economic tools of analysis. Possible tools of analysis include allocative (in)efficiency (P>MC), dynamic efficiency, inequity. Appropriate use of tools of analysis will be awarded the "analytical" band.	8-10
L2	Underdeveloped analytical explanation or largely descriptive explanation of the factors that governments should stop **and** allow acquisitions OR A well-developed but one-sided answer on governments should stop **or** allow acquisitions. (Max L2 - 6)	5-7
L1	Mere statements without explanations OR explanations contain major conceptual errors.	1-4
E3	In-body evaluative comments are made and are backed by real world examples and economic analysis. Arguments are synthesized and presented in a well-reasoned manner, on whether governments should stop or allow acquisitions. To achieve E3, at least two industries are required.	4-5
E2	Some evaluative comments/attempts at making judgements using economic analysis, on whether governments should stop or allow acquisitions. Link to at least one specific industry is made.	2-3
E1	Unsubstantiated judgments on whether governments should stop or allow acquisitions.	1

Markers' Comments

SKILLS

Question interpretation

- Question was generally well interpreted. Most scripts accurately discussed the pros and cons of the acquisition, albeit in varying levels of analysis.

Analytical & Contextual Explanation (e.g choice of arguments, adequacy of rigour, choice of examples)

- Choice of arguments are **crucial** for this question, as there are some points that are clearly more **analytical** than others. (e.g. allocative inefficiency and dynamic efficiency being preferred to X-efficiency, inequity)
- Students who explained allocative inefficiency from market power tended to stop at showing the presence of allocative inefficiency from market power, rather than a **worsening** of allocative efficiency from increased market power from the acquisition. **Learning point: Need to discern a "change" (worsening allocative inefficiency) from a "state" (allocative inefficiency).**
- Students who explained dynamic efficiency and missed out on full credit tended to miss out on either explaining how higher profits lead to a higher ability to conduct R&D, or explaining how product or process innovation improves society's outcomes in the future (either through better quality products and consumer welfare, or lower prices from cost savings and a rise in consumer surplus).
- Also, many pointed out that dynamic efficiency may occur since the acquisition results in supernormal profits, which gives the firms the ability to innovate. However, to make such an argument, students must make the assumption that this supernormal profit is sustained for thorough analysis. Firms can only sustain their supernormal profits should the industry they operate in has high barriers to entry.

Evaluation
- Many students were able to evaluate based on the "nature of good/industry" involved, which is good, which allowed them to enter the E2 band with some evaluation.
- Many students that explained that acquisitions would further worsen the underconsumption in a merit good industry (e.g. healthcare) did it very loosely and without much explanation of what a merit good is.

CONTENT (Major misconceptions)
- Some students attempted to explain a fall in consumer surplus from the diagram. This is not possible as consumer surplus pre and post-acquisition cannot be compared as the two demand curves are not for the same number of consumers. The only way to do this is via the definition of consumer surplus, which is the difference between the willingness and ability of a consumer to buy and the price they actually pay.
- There seemed to be some confusion between **dynamic inefficiency** and **X-inefficiency**. X-inefficiency refers to the increase in cost of production due to complacency and the lack of incentive to keep costs low, while dynamic inefficiency refers to the lack of ability and/or incentive to engage in R&D. Students should not use the two interchangeably.

Question 4
Due to the outbreak of COVID-19, Singapore closed its borders to short term visitors and some foreign labourers in 2020.

(a) Using AD-AS analysis, explain how the closure of international borders can adversely affect an economy. [10]

(b) **Discuss how different countries will adopt different policies to tackle these consequences. [15]**

Requirements for (a):

R1: Explain how the closure of international borders affects the AD and impact on the economy
R2: Explain how the closure of international borders affects the AS and impact on the economy.

Suggested answer (a):

Introduction

To analyze the effects on an economy, we will use the AD-AS model. Through this model, we are able to explain how the changes in AD and AS will affect the economy in terms of economic growth, unemployment and inflation.

Body

[P] The closure of international borders will result in **a fall in the AD** for an economy.
[E, E] The aggregate demand (AD) for an economy is made up of the consumption expenditure (C), investment expenditure (I), government expenditure (G) and net trade expenditure (X-M). The closure of international borders will lead to fall in the AD for an economy via a fall in (X-M) and a possible fall in I.
For example, for a country like Singapore that relies on tourism, which is a form of service export, the closure of international borders meant that there will be a reduction in the number of tourists that visit Singapore. This would lead to a fall in export revenue (X). Thus, assuming import expenditure (M) to be unchanged, the fall in (X-M) will lead to a fall in the AD.
When a country like SG closes its border to some foreign workers, this also leads to an increased anticipation of a rise in wage costs that may deter the inflow of foreign direct investments (FDI) as well as cause a reduction in domestic investments. Hence, the reduction in investments will also lead to a fall in the AD.
With border closures, there will also be supply chain disruptions that leads to a reduction in the volume of trade. This could result in a fall in (X-M). For countries that are particularly dependent on export growth, this could result in a fall in its AD.

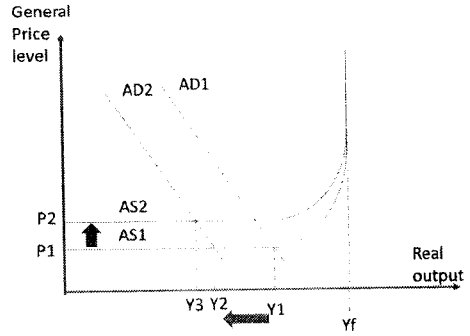
[Note: Other reasons include fall in C and I due to expectations of closure that worsens business outlook]

[L] Thus, the closure of international borders **not only affect (X-M) but also lead to a temporary fall in (I)**, leading to an overall fall in the AD for a country.

[P] The closure of international borders will result in **a fall in the AS** for an economy.
[E, E] The fall in the aggregate supply (AS) for an economy may be caused by a rise in the unit cost of production (UCOP) or a fall in the productive capacity (LRAS). The closure of international borders may lead to a fall in the quantity of factors of production (FOP) that is needed for production. Such a temporary shortage would lead to a rise in price (wage for labour), leading to a rise in cost of production.
For example, raw materials are now more expensive due to supply chain disruptions (shortage of workers globally that leads to rise in shipping costs). For a country like Singapore that lacks natural resources, the rise in raw material cost will lead to a rise in the UCOP. Hence, there will be a fall in the AS.
In addition, for a country like Singapore that relies heavily on foreign workers from Malaysia, she may suddenly face a shortage because these workers are now unable to cross the border to work here. This would also lead to a rise in the UCOP, leading to a fall in the AS in the short term. If this is prolonged, the overall capacity of the country would fall because of the reduction in the quantity of labour in the country.

[L] Hence, the closer of international borders can **affect both the UCOP as well the productive capacity of a country**, leading to a fall in the AS.

Figure 1. Shifts in AD and AS due to closure of international borders



Note: We omit the explanation on the impact on vertical AS (potential growth) because if the economy is not operating in that region, the immediate concern for the government would be on actual growth.

[P] The **fall in AD and AS will have negative impact** on an economy.
[E, E] Initially, the economy is operating at AD1 and AS1 where the equilibrium national income is Y1 and the full-employment output level is at Yf. As seen in Figure 1, the fall in AD is illustrated by a leftward shift in the aggregate demand curve from AD1 to AD2. When that happens, there will be an unplanned rise in inventory levels that causes firms to cut down on production. As the firms do so, household incomes will fall because firms now hire lesser workers. This fall in income will result in a fall in induced consumption of domestically produced goods/services that leads to a further fall in AD. This will result in firms cutting down on production again that leads to further fall in households' incomes. This process will continue until total injection = total withdrawal and a new level of equilibrium national income is achieved. Correspondingly, there will be a rise in demand-deficient unemployment due to increase in output gap of Y2-Yf.
The fall in the AS is illustrated by an upward shift in the AS curve from AS1 to AS2. As the UCOP rises, there will be fall in national income (due to a fall in the wealth effect) from Y2 to

Y3 that is seen in the movement along AD2. One reason for the upward movement along the AD is the real wealth effect where the fall in real wealth discourages consumption.

[L] The resultant effect of a fall in AD and AS is a **fall in national income** (Y1 to Y3) and **rise in the general price level** (P1 to P2).

Conclusion

The prolonged closure of international borders will lead to fall in actual growth and result in inflation for an economy. The degree of these negative consequences of will depend on the initial state of the economy and rise in the UCOP.

Mark Scheme

Level / Marks	Descriptors
L3 8 - 10	Detailed explanation of how the closure of international borders will lead to a **fall in both the AD and AS** for an economy, with the aid of a **diagrammatic analysis**. The explanation on the negative outcome on the **general price level and the national income** should be supported by the **multiplier process**.
L2 5 - 7	Explanation of BOTH a fall in AD AND fall in AS, with some gaps or errors in diagrammatic analysis (i.e. cursory explanation or without multiplier process) **Max 6m**: Detailed explanation of either fall in AD (with multiplier process) OR a fall in AS with impact on national income or general price level.
L1 1 - 4	Explanation that lacks understanding of how a closure of international borders affect the components of the AD or AS Eg. Fall in X without explaining why or mistaking fall in tourism as a reduction in C.

Markers' Comment

SKILLS

Question interpretation

- Given that the question explicitly stated for students to use AD-AS analysis, it should be a big hint that both AD and AS factors are relevant to this question. Some scripts only focused on (multiple) AD factors, which resulted in a lack of scope. Whereas some considered the impact on BOT and structural unemployment, which is not answering the question (no application of AD-AS analysis for these impacts).
- Students can also gather clues from the rest of the question. Part (b) requires the discussion of different policies to deal with the consequences from part (a). This should thus be a clue that the part (a) response needs to arrive at **two distinct consequences**.

Analytical & Contextual Explanation (e.g choice of arguments, adequacy of rigour, choice of examples)

- For R1, when explaining the fall in AD due to the fall in tourism arrivals, the relevant AD factor is X, not C, as tourism involves foreign households consuming our domestically produced goods and services.

- Other scripts explained that the fall in X was due to a fall in trade overall. Based on the preamble, the border closures led to a fall in tourist arrivals. In order to establish a fall in X from goods, students need to explain that the border closures could have led to supply chain disruptions, which would then raise the uCOP and hence price of exports, so quantity demanded falls (and then make the link to export revenue). However, this is less direct than the point on tourist arrivals.
- At this stage, the multiplier explanation is still incomplete or inaccurate on some scripts.

- For R2, many scripts linked the border closures to a fall in quantity of labour and hence potential growth. While this could happen if there is indeed a net outflow of labour, negative potential growth has no *direct* impact on the economy (unless the economy is suffering from demand-pull inflation). It is necessary to link to an **actual** impact i.e. rise in GPL and fall in real GDP, as the fall in labour supply leads to higher wages and hence higher uCOP for firms.

- Similarly, some scripts also explained that the fall in X (R1) led to a worsening of the BOT. While this is technically accurate, there is no other *direct* impact on the economy, apart from what would have been explained earlier about the fall in (X-M) leading to a fall in AD and hence negative actual growth. As such, this would not have been a valuable point to write about.

- In explaining how the fall in AS leads to cost-push inflation and/or a fall in real GDP, students need to explain the adjustment process:
    - Cost-push inflation: Firms pass on the higher uCOP in the form of higher prices of goods and services / firms are only willing able to accept higher prices for the same output
    - Negative actual growth: Movement along AD via the wealth, real balances and international substitution effects

CONTENT (Major misconceptions)

- Some students are drawing their AS curves without an upward sloping portion (i.e. just the horizontal and vertical segments). This is technically inaccurate.
- In the multiplier explanation, it is more accurate to use 'households' instead of 'consumers' because the economic agent affected is households (who provide labour to firms) that led to a fall in induced consumption.
- Other weak responses explained that border closure will result in a fall in export revenue (X) without explaining why it is so. This could be explained in terms of volume of trade that is disrupted by supply-chain distortions caused largely by labour disruptions (eg. shipping and transportation businesses for raw materials). However, this would also impact import expenditure negatively (M).

(b) Discuss how different countries will adopt different policies to tackle these consequences. **[15]**

Requirement for (b):

R1: Explain how **a country may use a particular macro policy tool** (EFP/EMP/SS-side) to tackle the consequences

R2: Explain how **another country may use a different type of policy tool** (EFP/EMP/SS-side) to tackle the consequences

EV: Different countries will adopt different policies because:
- Possible difference in state/nature of their economy
- Possible difference in appropriateness/effectiveness of policies
- Possible difference in extent of impact (negative growth vs cost-push inflation)

Suggested answer (b):

Introduction

In our analysis in part (a), countries will face a fall in national income and a rise in the general price level, both of which indicate negative performance in the economy. As such, countries will undertake policies to tackle these consequences.
Different countries may adopt different macroeconomic policies to deal with the negative consequences of a closure in international borders. This may be due to differences in the effectiveness of similar policies used or degree of these consequences.

Body

[P] A country may use **expansionary demand management policies** to tackle the consequences in the form of negative economic growth.
[E, E] To tackle the consequences of negative economic growth, a country may adopt expansionary fiscal policy to boost its AD. For example, a country that has a large domestic economy such as the US will experience a significant impact on its GDP when components of the AD such as C, I and G changes. This can be done via a cut in direct tax or an increase in government spending, G. A cut in personal income tax will increase the disposable income for households to boost their consumption spending, C. A cut in corporate tax will increase the post-tax profits of investments for firm to encourage more investment spending, I. The rise in C, I and G will help increase AD that bring about a positive multiplier effect to raise national income.

[EV] However, the **extent of increase** in C and I is dependent on the **expectations of the economy** in the future. If the outlook is bleak, households and firms may withhold their spending. For countries with a smaller domestic sector and where sentiments are weak, boosting C and I may not be effective to promote economic growth.

[EV] Similarly, the cut in taxes and rise in government spending may **worsen the fiscal budget**. Any borrowing by the government to fund its budget will result in **crowding-out effect**, where the rise in government borrowing to fund its rising budget deficit, lead to rise in interest rate which leads to reduction in consumption and investment, off-setting the expansion in AD that was created by the rising budget deficit. For countries with a tight fiscal budget, expansionary fiscal policy may be limited.

[E, E] An **alternative policy to boost AD could be expansionary monetary policy**. For example, a country like the US can do this via a reduction in the interest rate. When interest rates are cut, households may be encouraged to consume more because the opportunity cost to do so would have fallen. This is because the utility to consume is now higher than the interest payments derived from deposits. At the same time, the cost of borrowing would have also fallen. This would encourage households to borrow more to spend on big-ticket items; and firms are encouraged to invest more. This is because the MC of investment would have fallen. Since the MB is now greater than the MC, investments that were previously unattractive would now be lucrative enough for firms to take on. The rise in C and I will help increase AD that bring about a positive multiplier effect to raise national income.

[EV] Similarly, the extent of increase in C and I is dependent on the **expectations of the economy** in the future. If the outlook is bleak, households and firms may withhold their spending. For countries with a smaller domestic sector and where sentiments are weak, boosting C and I may not be effective to promote economic growth.

The rise in the AD, whether by expansionary fiscal or monetary policy, will lead to an unplanned fall in inventory levels that causes firms to step up on production. As the firms do so, household incomes will rise because firms now hire more workers. This rise in income will result in a rise in induced consumption that leads to a further rise in the AD. This will result in firms stepping up on production again that leads to a further rise in households' incomes. This process will continue until total injection = total withdrawal. A new level of equilibrium national income is achieved that is a multiple of the initial rise in the AD. As such, national income rises while demand-deficient unemployment falls.

[L] Hence, expansionary demand management policies may be adopted by countries to tackle the negative economic growth and reduce demand-deficient unemployment.

[EV] Different countries may achieve a similar effect to a different extent because of the **difference in the size of the multiplier**. A country with a lower degree of leakages such as the US will have a stronger multiplier effect than one with high leakages such as Singapore. The heavy reliance on imports and high savings rate in Singapore will lead to higher leakage compared to the US.

[P] A country may use **supply-side policies to tackle the consequences** of negative economic growth and inflation
[E, E] For countries like Singapore that rely heavily on foreign workers and imported raw materials may choose to adopt supply side policies instead. This is because the rise in UCOP may be more severe than the fall in AD. In our analysis above, the rise in UCOP has resulted in negative economic growth and inflation. Supply-side policies may be used to offset the rise in UCOP, thereby reducing inflation and restoring the loss in national income from a fall in the AS.
For example, automation may be adopted to offset the reliance on Malaysian workers who are now unable to cross the border to work in Singapore. With the rises in labour productivity from adopting automation, and assuming productivity rises by more than the wage rate, unit labour cost falls. Government may also provide temporary wage relief to firms to offset the rise in wage cost. Other forms of cost reliefs could also come in the form of temporary tax holidays. Such supply-side policies will lead to an increase in the AS for an economy because it is now cheaper to produce the same units of output. The resulting downward shift in the horizontal portion of the AS curve due to a fall in UCOP will lead to a movement along the AD curve. Hence, national output rises when GPL falls.
[L] Hence, a country that suffers the **effects of cost-push inflation to a larger degree** may adopt supply-side policies to tackle the consequences of a border closure.

[EV] For a country that was initially suffering from demand-pull inflation, the fall in AD caused by the closure of international borders would actually be beneficial for them. Hence, such a country would most likely choose to adopt supply-side policies that will shift the vertical AS rightwards instead because it helps to reduce the rise in GPL and leads to a rise in national income to better target the root cause of the cost-push inflation.

Conclusion/Evaluation

[Stand] The effectiveness of the policies adopted by different governments hinges very much on the **problem(s) created by the closure** of international borders (which is partly dependent on the initial state of the economy), the nature of their economies and the **mix of policies** that are adopted by the governments.

[Substantiation]
The **initial state of the economy** may determine whether a country would choose to adopt supply-side policy or demand-management policies. If the economy was initially suffering from demand-pull inflation, the fall in AD from the closure of international borders helps to reduce the problem; and the use of supply-side policies would be more effective to generate actual growth and lower inflation.
The **extent / type of problems** created the closure of international borders determines to a large extent **what policies a government chooses**. For some countries, the effects of rise in UCOP may be more severe than fall in AD because of the nature and their initial state of the economy. In this case, the use of supply-side policies will **better target the root cause** (horizontal vs vertical portion of AS) of their problem more effectively. For example, a country like Singapore that relies on imported raw materials and foreign labour, she should adopt short-term supply-side policies to mitigate the rise in UCOP.
In addition, for a smaller country like Singapore, the use of fiscal policy to address the recession caused by border closure might not be as effective as in the US. This is because although Singapore does not face a crowding-out effect, she has a **smaller domestic market** and a much **smaller multiplier size** due to her high MPS and MPM. Thus, besides expansionary fiscal policy, Singapore also uses supply-side policy like wage subsidy to generate actual growth. On the other hand, a **big and less open economy** like US could use fiscal policy but will face the issue of crowding-out effect. Hence, to boost the effectiveness of demand management policies, the country tends to also use expansionary monetary policy like interest rate cuts.
A country like the US could also **use wage subsidy**, but the scope of its use would be more limited compared to Singapore, given its **lack of fiscal reserves**.

Mark Scheme

Level / Marks	Descriptors
L3 8 - 10	Well-explained analysis on **how and why different countries used different policies** to tackle negative economic growth and cost-push inflation. Answer should be supported by **appropriate examples or contexts**.
L2 5 - 7	Analysis that has some gaps in explanation (cursory explanation) of how policies work and **lack examples** to illustrate. **Max 6 m**: For analytical explanation of only 1 policy or policies that only tackle one problem (consequence).

L1 1 - 4	Some attempt to answer the question without any examples or application of a relevant economic model or answers that contain obvious flaw in theory.
E3 4 - 5	For an answer that demonstrates **contextual analysis** (eg. Demonstrates understanding of country contexts) and is able to **weigh the relative effectiveness** of the policies used by **different countries**; and limitations in the conclusion.
E2: 2 - 3	For an answer that makes **some attempt to support the evaluation or conclusion**
E1: 1	For unsubstantiated conclusion.

Markers' Comments

SKILLS

Question interpretation

- A handful of students structured their response in terms of **why** different countries adopted different policies, rather than **how**. While this is not wrong and is important for evaluation, it inadvertently resulted in less analytical policy explanations, which limited their ability to score for content.
- The command word 'how' means that students are expected to explain how the proposed policies work and these should come with their limitations in the explanation.

Analytical & Contextual Explanation (e.g choice of arguments, adequacy of rigour, choice of examples)

- Given the phrasing of the question ("discuss how different countries will adopt..."), the explanation of the different policies adopted by different countries needs to be contextualised to specific countries. A number of scripts merely explained the policies theoretically – in such cases, it is difficult to award L3 marks since the question is not being answered directly. Weaker responses merely compared the different policies without taking into consideration the context of different countries.
- A handful of scripts explained interest rate policy for R1 and exchange rate policy for R2. Although this is valid, such a response would be relatively lacking in scope as it is essentially only focusing on expansionary monetary policy (and focused on AD deficient problems). This is even more critical if part (a) highlighted supply-side problems; which means the essay did not address the consequences that were explained in (a).
- Some students chose to explain trade policies (i.e. FTAs) as a means to increase EG. While the cause-effect relationship can be explained, FTAs are in reality not typically employed in order to increase AD. Furthermore, in light of the international border closure, there are supply-chain disruptions that make this policy less effective and more time-consuming.
- Students who explained negative potential growth (see markers' comments in (a) for the issue associated with this) as an impact in (a) typically explained long-run supply-side policies here. While this is relevant to the identified consequence, increasing potential growth in this context would do nothing to solve the immediate macroeconomic problems faced by the country (negative actual growth + cost-push inflation) as a result of the border closures.

Evaluation

- The evaluation for this question requires students to justify why different countries adopt different policies to solve the problems explained in (a). As with all evaluative conclusions, students should try to make their assessments based on certain angles/bases of comparison e.g. nature of economy or state of the economy.
- Many evaluation attempts were also not contextualised to the issues faced in the question – e.g. some students brought in SSP to deal with structural unemployment when this was not a macroeconomic problem brought up in (a).
- Some students attempted to evaluate based on the stand countries should use a mix of policies to tackle multiple issues. This does not directly answer the question as the question asks for how different countries choose different policies. An alternative approach in the use of this angle is to explain how different countries use different mixes of policies (e.g. SG uses both expansionary fiscal policy and gradual appreciation of SGD as demand management tools to manage both falling AD and imported inflation, whereas another country like USA may use interest rate policy and expansionary fiscal policy to boost domestic spending).

CONTENT (Major misconceptions)

- In general, students are familiar with the mechanics of the various macroeconomic policy measures. Changes in corporate tax affect firms while changes in personal income tax affect households. Changes in interest rates affect firms' borrowing cost while the same affect households' opportunity to save/consume.
- While solutions such as skills re-training/upgrading can increase labour productivity, these measures take time and will not be able to tackle the immediate concern of rising uCOP.
- In the explanation on cutting taxes (or reducing interest rates), some responses used consumers instead of households. A cut in personal income tax will increase the disposable income of households because this economic agent is the one that provides labour to firms and earns wages (income).
- For answers that argued that there would be supply-chain disruptions due to border closures, using exchange rate-centred monetary policy would be very limited despite the relative price changes because it is the supply choke that is restricting trade volumes.

Question 5

Monetary policy - generally conducted by central banks such as the U.S. Federal Reserve (Fed) or the European Central Bank (ECB) - is a policy tool for achieving low inflation and economic growth.

(a) Explain the economic consequences when central banks are unable to achieve low inflation. [10]

(b) Assess the likely impact on the living standards of Singapore residents when the US central bank cuts interest rate. [15]

Part (a)'s suggested answer

[R1] Explain one economic consequence when inflation rates are not low

[R2] Explain a second economic consequence when inflation rates are not low.

Introduction

Inflation is a situation where there is a sustained increase in the general price level (GPL) of an economy. Central banks around the world usually aim for a low inflation rate of about 2%. This is the main objective of central banks as this low rate is associated with good economic performance in an economy. Higher or negative rates of inflation usually leads to problems that imposes various costs to the economy.

Body

[P] High inflation rate leads to price instability and creates uncertainty for businesses and discourages investments as well as worsens price competitiveness of the country's exports leading to a fall in economic growth.

[E] In order for firms to undertake investments, they need to be assured of the profitability of their investments, which would entail them being able to accurately forecast their expected revenues and cost incurred in producing goods and services and hence profits. Having a high inflation rate would result in the price signals provided by the market being distorted and this uncertainty would make it difficult for businesses to plan for their future needs. In addition, an economy experiencing high inflation could indicate the economy is not doing well and decrease firms' business confidence and hence their expected rates of returns on investments. Thus, investments will be discouraged leading to a decrease in AD which not only leads to a multiplied decrease in real NY and lower levels of employment via the multiplier effect but also negative potential growth in the economy, if the rate of capital accumulation is less than the capital depreciation rate. This will worsen the actual and potential economic growth performance of the country.

[E] When a country has a high inflation rate compared to their trading partners, this will mean that prices of the country's exports would become less price competitive in the world markets leading to a lower quantity demanded by foreigners and a decrease in the export revenue. In addition, locally produced goods are now relatively more expensive compared to imports leading to a rise in import expenditure, as residents switch to foreign goods instead of consuming the relatively more expensive domestic goods. This increase in M and fall in X due to a rise in the GPL will lead to decreases in real national income and hence negative economic growth through the international substitution (NOTE to students: This is a movement along AD because it is a response to a change in GPL).

[L] Therefore, not being able to maintain a low inflation rate discourages investment and exports needed for economic growth in an economy.

[P] Low inflation is needed in order to allow the market to allocate resources efficiently and prevent the wastage of resources such that society's welfare can be maximised.

[E] When inflation becomes too high and/or rising, prices no longer change in a predictable manner. When the price of a good increases a producer is unable to clearly determine if the price increase is indeed due to an underlying increase in consumer preference and hence demand for that product. He may choose to allocate more resources to the production of that good, but it may be the case that consumer demand has not increased at all. This will lead to an inefficient allocation of resources because increasing production level of the good causes the output level to reach a point where the MB of consuming the good will be less than MC of producing it, resulting in welfare loss for society. Due to scarcity, it is important that resources be allocated in a way which maximises society's welfare, i.e. one whereby allocative efficiency is attained. In a market economy, price signals are the mechanism by which it is attained – higher prices indicate rising consumer preference for the good – and hence resources should be allocated to fulfill consumers desire for the good, just as falling prices signal to producers to allocate less resources to the good. Hence with the distortion of the price mechanism because of high inflation, society's welfare will not be maximised.

[E] In addition, high inflation would also impose menu costs on an economy as business would have to constantly have to decide on new prices, change price labels and print new menus or catalogs when prices change. When there is high inflation (e.g. hyperinflation), firms will see such costs rise rapidly as they have to change prices very often to keep up with all other prices in the economy. This would lead to a wastage of resources that could have been used for other purposes that could contribute to a higher economic well-being of society.

[L] Therefore, maintaining a low inflation rate can prevent inefficiencies arising from price instability.

[P] A high inflation rate makes it harder to maintain the SOL of the country's residents/lead to the SOL falling.

[E] Inflation reduces the internal value of money. When inflation is high and nominal wages remains constant or rises less than the inflation rate, the purchasing power of workers and hence households will fall as they are able to purchase less goods and services with the real incomes they receive. This usually applies to casual workers whose wage rates are not indexed. Inflation thus reduces their material SOL of such residents.

[E] In addition, if inflation is high, then the real interest rate would be lower as the real interest rate is given by nominal interest rate minus inflation rate. A high inflation rate would disadvantage savers, as the real returns on savings would become lower. This may be of particular concern for retirees who are living off their savings or are drawing a fixed income from pensions or retirement funds, hence their material SOL would be lowered. Conversely, if there is deflation, then the real interest rate would be higher, which would disadvantage borrowers as the real burden of debt is increased. This would adversely impact young home buyers who may be borrowing to finance their purchase, with the increased real burden of debt meaning that more consumption would have to be sacrificed to repay the interest in real terms, causing a decline in material SOL.

[L] Therefore, a high inflation rate would worsen the SOL of various residents in a country.

Mark Scheme

Level	Descriptors	Marks
L3	For a well-developed analytical explanation of at least 2 economic consequences when central banks are unable to achieve low inflation	8 – 10
L2	Answers that provide an incomplete or descriptive explanation of the costs of high/negative inflation.	5 – 7

L1	For an answer that demonstrates some knowledge of a low inflation rate and impact of high inflation / deflation on an economy	1 – 4

Markers' Comments:
SKILLS
Question interpretation
This is a question that is primarily about the negatives of either high/unstable inflation or deflation (since this will be the outcome when the objective of low inflation is not met) or positives of low/stable inflation, rather than the causes of inflation.

Analytical & Contextual Explanation (e.g choice of arguments, adequacy of rigour, choice of examples)

- The impacts that students provided either tend to be too narrow, focusing only on the impact on macroeconomic goals or lack sufficient economic rigour.
- The explanation of why high inflation leads to falling investment tended to be weak - with a vague reference to poor business outlook.
- It is not enough to argue how consumers will be affected simply through real income falling when there is inflation due to % change in real income = % change in nominal income - inflation rate without clearly explaining how inflation affects internal value of money or cost of living.
- The negative impact of high inflation should not be even higher inflation. Need to bring in other economic issues that are associated with high/negative inflation instead.

CONTENT (Major misconceptions)

Mistake	Correction
High inflation leads to poor economic outlook by households, causing them to save more and hence consume less.	Students who argued this way are probably thinking about the effects of unemployment - where households worry about losing their jobs and hence save more in the current period. On the other hand, high inflation actually encourages more consumption in the current period because money becomes a poor store of value and so households would rather spend than save their income. Nonetheless, this higher consumption should not be brought up here since the question is not looking for positive effects of high inflation). In addition, an analysis on how the higher AD from higher C leading to higher inflation as a negative outcome is also not appropriate as the impact of higher inflation should not be about causing higher inflation.
Inflation causes a fall in net exports / fall in consumption, leading to a fall in AD	It is correct to explain that inflation leads to fall in net exports (international substitution effect) or fall in

(represented by leftward shift of AD).	consumption (real wealth effect) but this leads to *movement* along AD.
Cost-push inflation leads to fall in national income (draw AS shifting left and cutting AD at a lower real GDP level).	The graph is correct but it is not the cost push inflation that led to the fall in real GDP in the diagram. It is the fall in AS (due to rising unit COP) that led to both inflation and falling real GDP concurrently. If you wish to explain that cost push inflation leads to negative growth, the explanation should be about lower profit margins discouraging investment etc. Nonetheless, it would be more appropriate to link lower investment to the greater uncertainty associated with higher inflation instead

- When arguing that high inflation leads to fall in investment, it doesn't make sense to start from the horizontal segment of AD cutting AS because then, where is the DD-pull inflation to begin with? (unless the inflation was cost push).
- Wrong terminology - If one is referring to falling real GDP or falling full-employment national output, then it should be described as negative actual growth (not fall in actual growth) and negative potential growth (not fall in potential growth).

(b) Assess the likely impact on the living standards of Singapore residents when the US central bank cuts interest rate. [15]

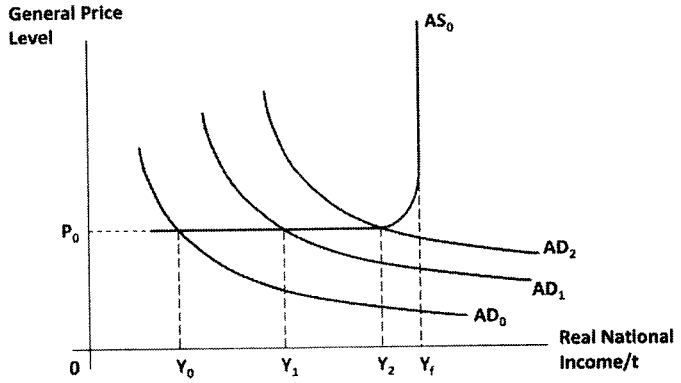
[R1] US central bank cutting interest rates will positively affect SOL in Singapore
[R2] US central bank cutting interest rates will negatively affect SOL in Singapore

Introduction

Interest rates are monetary policy tools used by central banks to achieve a country's macroeconomic goals. A country's living standards refers to the material and non-material well-being of its residents. Material well-being stems from the consumption of goods and services, while non-material well-being stems from the intangibles, such as the state of the environment, amount of leisure time, etc.

Body
[R1] US central bank cutting interest rates will positively affect material and non-material SOL in Singapore
[P] A cut in US interest rates will result in higher economic growth for Singapore.
[E] With the US central bank cuts the interest rates, the cost of borrowing will fall for both US consumers and firms. Consumers will find it cheaper to borrow to purchase durable goods and services. In addition, as they receive lower returns to their savings from banks, the opportunity cost of spending decreases. This will lead to a fall in savings and together there will be a rise in consumption expenditure. For firms, if expected rate of returns remain the same, the lower cost of borrowing will mean a lower marginal cost of investments, leading to investment projects that were unprofitable in the past to be profitable now. Hence this leads to a rise in Investment expenditure (I) as there is more incentive to expand firm capacity. A rise in C and I will cause AD to increase.
[E] As AD rises from AD0 to AD1, AD exceeds output. US firms will experience an unplanned fall in inventories which will signal to them to step up production and demand for more factors of production (e.g. labour) in order to produce more (Y0 to Y1). As output and income increase, households will spend a portion of their income increase on domestically

produced goods and services, causing AD to rise further to AD2. At the same time, households save a part of their increased income, pay more taxes and spend on imports, causing withdrawals to increase. Since the spending by one is income for another, the cycle continues until withdrawals once more equate injections. Assuming there is spare capacity in the economy, these successive rounds of spending lead to multiplied increase in national income for the US from Y0 to Y2.



[E] As NY rises in the US, US households will have greater purchasing power and will likely increase their demand for imports since import is a function of income. This will benefit Singapore as some of this increase will be for exported goods from Singapore. As Singapore sees a rise in (X-M), this will in turn lead to a rise in AD. Similar to what was explained earlier, Singapore firms will also experience an unplanned fall in inventories which will signal to them to step up production and demand for more factors of production (e.g. labour) in order to produce more. As output and income increase, households will spend a portion of their income increase on domestically produced goods and services, causing AD to rise further and the cycle to repeat. Hence, demand-deficient unemployment will fall and there will be a multiplied increase in national income an actual economic growth. Assuming that the population level stays the same, the **real GDP per capita** in Singapore should rise and this will result in greater purchasing power to buy goods and services for the satisfaction of their wants and needs. This will lead to an increase in their material living standards.
[E] In addition, the increased economic activity and higher income levels will lead to increases in tax revenue collected by the Singapore government from direct taxes such as income and corporate tax as well as indirect taxes such as the goods and services tax. This will increase the government's ability to spend on items that contribute to households' material and non-material SOL e.g. increase spending on health care, education and various social amenities, as well as green technologies to reduce pollution levels.
[L] Thus, the higher Economic Growth in Singapore because of the cuts in US Interest Rates will lead to an increase in both material and non-material SOL of Singapore residents.
[Ev] The extent of increase in X revenue for Singapore from the interest rate cuts depend on consumer and business confidence in the US. If consumers and firms are generally pessimistic, then the interest rate cuts are unlikely to cause C and I to rise significantly, thereby limiting the increase in national income in the US. This means that the impact on Singapore's economy might be limited as the level of X will not increase significantly.

[Possible alternative EV] Lower interest rates in the US might result in hot money (short term capital) outflows that will cause the US$ to depreciate (SGD gets stronger) as SS of US$ increases in the currency markets. This may cause goods and services from the US to

be relatively cheaper in terms of Singapore dollars and so Singapore may increase quantity demanded for imports from the US. If demand for the imports is price elastic, it will result in a rise in M. Furthermore, the weaker USD would cause exports from Singapore to be relatively more expensive in USD, causing US consumers to demand less of Singapore's exports. This may lead to a fall in X. The fall in X-M and AD (If more significant than the initial change due to higher national income in US) will negatively impact Singapore's actual growth and cause a rise in demand-deficient unemployment. This would lead to a fall in SOL as these workers are unable to purchase as many goods and service as before. (or offset some of the initial gains from the initial increase in AD)

(*Possible indirect positive impacts to consider)
When the US central cut interest rates, Singapore's interest rates will fall too due to Singapore being an interest rate taker. So, consumption and investment levels in Singapore might also rise leading to an increase in AD and subsequently higher AG and PG which improves the SOL.
Higher EG in US could lead to better business confidence of firms/global outlook since it's the world's largest economy and result in increase FDI (especially in high tech/clean energy industries) to Singapore which will help AG and PG leading to higher SOL.

[R2] US central bank cutting interest rates will negatively affect material and non-material SOL in Singapore
[P] US interest rate cuts may increase inflationary pressures in Singapore.
[E, E] If the Singapore economy is operating near full employment, the rise in AD from the higher export revenue will result in a rise in the general price level (GPL) and greater demand-pull inflationary pressures. This is because when output is increased, the resulting fall in unemployment means that firms are less able to get the resources that they need, resulting in less efficient factor combinations and rising unit cost of production. Hence, firms are only willing to sell their output at higher prices. The increase in general price level will lead to a rise in the cost of living for the residents in the country.
[L] Assuming the average household's nominal income rises more slowly than the GPL or remains unchanged, there will be a fall in its real income, that is, a fall in the amount of goods and services that households can consume resulting in a lower material standard of living.

[P] The rise in economic activity from a cut in US interest rates could lead to a fall in non-material SOL in Singapore
[E] The higher demand for Singapore exports from the US will mean firms in Singapore will likely increase their production of goods and services. This increase in economic activity will likely result in increased negative externalities caused by pollution from factories as well as transportation services (cars and trucks) as firms and consumers in their pursuit of self-interest will only consider private marginal benefits in their decision making and will not bother to internalize the negative externalities by reducing the pollution created by their production activities. The pollution could lead to a fall in the air quality and the increase production of transport services lead to an increase in level of traffic congestions in the country resulting in a lower quality of life as the health of the residents are adversely affected.
[E] In addition, rising economic activities would usually be accompanied by rising working hours that would affect the amount of time workers have for rest and other leisure activities. This is because, in the short run, firms will not be able to increases its fixed factor (e.g. factor building) to increase its output and would likely resort to increase output by getting their employees to longer hours each day. This longer working hours and pressure to meet higher production levels would also increase the stress level of workers and adversely affect their mental health and quality of life.
[L] The worsening of the quality of life would result in a fall in the non-material SOL.

Conclusion

[Stand] In conclusion, although there could be both positive and/or negative impacts on the living standards of Singapore residents when the US central bank cuts interest rate, given the nature of the Singapore economy, the overall impact would likely be positive.

[Substantiation] Due to the small and open nature of the Singapore economy, a rise in (X-M) is likely to increase her AD and thus income significantly, as X takes up a large proportion of Singapore's GDP. Even though the change in income levels for the US due to the interest cuts might not be large, the fact that US is one of the top export destinations for Singapore would mean that even a slight increase could lead to a substantial rise in X from Singapore. This would result in a rise in Singapore's EG and thus SOL of its residents. (Furthermore, the possible fall in Singapore's interest rate could also further increase AD due to increases in C and I)

Although there might be the potential of inflationary pressures, given the current economic state in Singapore, it is unlikely that will be a significant lack of spare capacity. In addition, the cut in interest rates in US might lead to an inflow of short-term capital (hot money) from US to Singapore leading to an appreciation of the SGD (fall in the value of the USD) and a fall in the prices on imported factors inputs (which are all priced in USD) for Singapore. This will help reduce imported inflation and offset any possible demand-pull inflationary pressures. The possible non-material issues such as higher pollution levels due to the higher levels of economic activity are also unlikely to have any major negative impact in Singapore given the structure of the export sector as well as various government policies that are already in place. Unlike many countries which rely on more pollutive methods of production, Singapore firms tend to use less pollutive methods given the high tech/value exports that is produced as well as the stringent environmental regulations that are strictly enforced. Thus, the cutting of interest rates by the US central bank would result in an increased in SOL of Singapore residents.

Mark Scheme

Level	Descriptors	Marks
L3	A well-developed and balanced economic analysis of how material and non- material SOL in Singapore will be affected by interest cuts carried out by the US central bank.	8 – 10
L2	Incomplete or undeveloped answer on the positive and negative impacts on SOL in Singapore when the US central bank cuts interest rates or One sided analysis of either the positives or negative impacts on SOL.	5 – 7
L1	For an answer which shows some knowledge about interest rate cuts in and its impacts on an economy.	1 – 4
E3	Provides clear economic analysis with reference to the context of SG when supporting the stand. There is a well substantiated summative conclusion.	4 – 5
E2	Relevant evaluative comments of the arguments, based on the context of SG No summative conclusion	2 – 3

E1	Makes a stand on the likely impact on the livings standards of Singapore residents when the US central bank cuts interest rates.	1

Markers' Comments:

SKILLS

Question interpretation

- Failure to provide two sides to the analysis - there was a tendency to focus only on the positive effects of a cut in interest rate by the US, on the SG economy.

Analytical & Contextual Explanation (e.g choice of arguments, adequacy of rigour, choice of examples)

- The argument that a cut in interest rates by the US could lead to a fall in non-material SOL of SG residents tend to be too descriptive (i.e. lacking in economic analysis).
    - To explain that the AG generated for SG, from interest cuts, could lead to increase in work hours, students should bring in ideas from 'Firms and Decisions' topic. For example, when AD rises and firms wish to increase production, in the short run, factors like capital (e.g. plant size) are fixed and so the only way to produce more would be to operate the plant for longer hours, which entail getting workers to work longer hours. Similarly, to explain why pollution tends to rise with AG, students could have explained that firms in pursuit of self-interest of profits maximisation tend to disregard the negative externalities of the pollution that arise from their production.
- There were students who argued that the cut in interest by the US could lead to inflation in the US, and this in turn leads to imported inflation for SG. While this is a possible effect, it should not be a key point because while the rise in AD (from cut in interest rate) could lead to some rise in USA's GPL, this phenomenon is not likely to be very major - and this is because there is likely to be much slack in the US economy (i.e. Not close to Yf) for the US central bank to go for a cut interest rate to begin with.
- The following arguments seen in some scripts were acceptable
    - Cut in interest rate (i/r) by US led to hot-money inflow into SG causing SG's i/r to fall and hence C and I in SG to rise
    - Cut in interest rate (i/r) by US led to hot-money inflow into SG causing forex rate of SGD to appreciate. Since MAS operates a managed float system, MAS intervened by selling SGD (buy USG). This led to a rise in SG's *domestic money supply* which in turn led to a rise in AD through higher C and I. (Note that the inflow of hot money does not automatically result in higher domestic money supply)

CONTENT (Major misconceptions)

- The concept of full employment/close to Yf/being close to productive capacity is generally poorly understood.
    - Firstly, there is a need to distinguish between being close to Yf and being at Yf. Being on Yf suggests that any further increases in AD is purely inflationary - such that *average* material living standards will fall as the cost of living rises. However, being close to Yf does not mean this will necessarily be the case as real NY is still rising. What is likely to happen is that material SOL of only some may fall - i.e. households not experiencing an increase in nominal incomes but experiencing the effects of rise in GPL.

- Secondly, it is **inaccurate** to state that large economies by definition are far from Yf in view of the large amount of resources they have while the reverse holds true for small countries. Being close or far away from Yf reflects the state of the economy, i.e. level of AD relative to productive capacity of the economy. The productive capacity of an economy is influenced by various factors and not the amount of resources a country has.

- There is confusion about the relationship between investment (purchase of capital goods like machinery, factory buildings) and interest rate and the relationship between hot money (purchase of financial assets like bonds) and interest rate.
  Learning point: Investment varies inversely with interest rate (think from borrower perspective), while hot-money varies directly with interest rate (think from lender perspective).

- The argument that a cut in interest rate by the US would lead to rise in foreign direct investment by US MNCs in SG is a weak one - this is because i) a US firm does not necessarily have to borrow from US to invest overseas, ii) choice of investment destination is affected by factors in in the countries that are receiving the FDI - e.g. unit COP; corporate tax rates; extent of protection of intellectual property rights.

- Hot money flows usually affect the demand and supply of currency or BOP but it is not a component of AD so the flows will not directly cause AD to change.

- Greater income inequality does not automatically mean a fall in material SOL. When high income earners earn more leading to greater income inequality, it does not equate to the lower income earning less. This the material SOL of low income earners will not necessarily fall.

Question 6
Singapore is one of the most competitive economies globally. Businesses in Singapore receive government support to uplift productivity, strengthen capabilities, and access new markets.
(a) Explain the reasons why a country's comparative advantage might change over time.
[10]
(b) Discuss the extent to which the measures adopted by the Singapore government aimed at increasing global competitiveness might cause difficulties for its economy.
[15]

Suggested answer

(a) Explain the reasons why a country's comparative advantage might change over time. [10]

Introduction
Comparative advantage is the ability of a country to produce a good or service at a lower opportunity cost compared to other countries. Based on the theory of Comparative Advantage (CA), a country can benefit from trade by specialising in the production of a good or service that it has CA in, and then export the good for which is has CA in production and importing the good that it has comparative disadvantage in producing. While the theory does assume that a country's CA is inherent in the factor endowment which is rather static, CA patterns can indeed change in the real world with different factors involved.

Body

[P] The main source of CA is the country's factor endowment, hence changing CA can be due to changes in factor endowment.

[E,E] Changes in a country's factor endowment may be due to **intensive usage of its natural resources.**
One example could be for countries that have abundant mineral resources such that the opportunity cost of extraction might be lower, and thus have a CA in production of minerals like coal or copper. Over time, as these resources are mined, the resources are depleted, thus diminishing the factor endowment of the country, and leading to a rise in opportunity cost of producing the raw material such that it could become higher than another country's opportunity cost of production, resulting in a loss of CA.

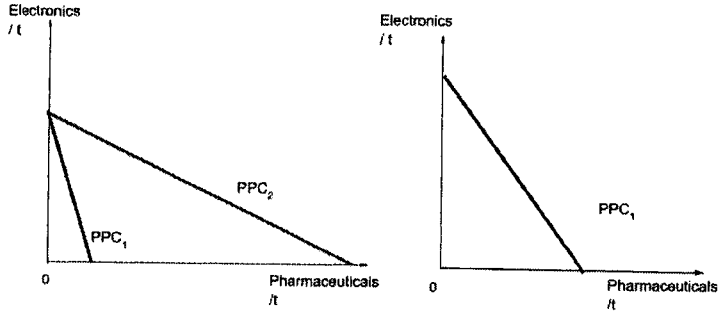
Another example of changing factor endowment can be seen in China. The relative abundance of cheap labour in China in the past allowed China to specialise in labour intensive production and export their goods, incurring lower opportunity cost compared to other countries. However, China is gradually losing CA in labour intensive goods as heightened demand together with **slower population growth has led to reduction in the abundance of labour in China**, increasing the opportunity cost of labour-intensive industries and this has eroded China's CA. Instead, production of labour-intensive goods like textiles has started to shift to other countries such as Vietnam, where there is greater relative abundance of low-cost labour.

[L] Hence changing factor endowment would lead to changing comparative advantage.

[P] A reason for a country to develop new areas of CA is through higher levels of investment and R&D, possibly with government support.

[E,E] For example, Singapore has been shifting into new areas of CA actively to avoid close competition with other global manufacturers with lower cost. Singapore has been shifting its focus away from electronics and instead to pharmaceutical and biomedical products. The Singapore government has provided infrastructure, for example the development of the Biopolis and the Tuas Biomedical Park and accompanying this were tax breaks and business incentives to attract foreign direct investments and R&D in the pharmaceutical sector. The higher level of investment will allow greater utilisation of new medical and production technologies which will help to lower opportunity cost in production and thus allow Singapore to gain CA in this area. By creating biomedical and pharma 'hubs', these sectors can also reap economies of scale through larger output, and which will further enhance CA in such products.

In the diagram below, Singapore initially has CA over Australia in producing electronics as she possesses the appropriate skilled labour and capital, as shown by PPC_1 while she has a comparative disadvantage in producing pharmaceutical drugs. Over time, as Singapore focuses its capabilities development on pharmaceutical industries by investing in human capital, the opportunity cost of producing pharmaceuticals becomes lower than Australia PPC_2 where Singapore now has a CA in producing pharmaceuticals. This is represented by SG's PPC now having a gentler slope compared to Australia's PPC.



Note– The diagrammatic representation is not critical for this answer. What is important to score for analytical explanation is to show understanding that when technology improves and/or capital is accumulated for one type of production (good X), lesser units of resources are now needed to produce it, such that the opportunity cost of producing it falls. And if the opportunity cost falls to a point that it becomes lower than another country, this country now has the CA in producing good X.

[P] Given the improvement in factor mobility across international borders, a country can develop new areas of CA by bringing in foreign resources.

[E,E] With globalisation, capital controls have been reduced. Countries can attract FDI by MNCs. The host country is thus able to accumulate capital and acquire the know how to produce certain goods at much reduced opportunity cost, causing them to acquire CA on production. For example, SG acquisition of CA in pharmaceutical drugs is not only due to

government investment in human capital but also due to attracting pharmaceutical MNCs to set up production in SG.

Markers' Comments

SKILLS

Analytical & Contextual Explanation (e.g. choice of arguments, adequacy of rigour, choice of examples)

- While this question is about comparative advantage (CA), there is no point in explaining the theory of CA. It would have been more critical to define the concept of CA.
- In fact, most scripts scored poorly because the explanation of the factors that affect opportunity cost was missing. **Learning point**: Practice articulating/writing out the answers if you want to explain something about changing CA
- The weakest answers were entirely descriptive and failed to demonstrate how the opportunity costs change over time for the countries.

CONTENT (Major misconceptions)

- **Learning point** :A fall in wage rates leads to a reduction in UCOP and does increase a country's export price competitiveness. However, such an explanation has focused on money cost instead of opportunity cost.
- Changes in CA are explained through the difference in opportunity cost when compared to another country rather than within the country alone. Just because Singapore has an ageing population does not mean it automatically has a CA in capital-intensive goods. It needs to be explained in relation to other countries.

Mark scheme

Level	Descriptor	Marks
L3	At least 2 well-developed explanations of how an economy's comparative advantage might change over time. Answer demonstrates how the relative opportunity cost of producing goods/service changed due to the factors.	8 – 10
L2	At least 2 explanations of how an economy's comparative advantage might change over time. Answer has conceptual errors or explain how the relative opportunity cost changed over time.	5 – 7
L1	Some knowledge on comparative advantage	1 – 4

(b) Discuss the extent to which the measures adopted by the Singapore government aimed at increasing global competitiveness might cause difficulties for its economy. [15]

Introduction

The global competitiveness of an economy can be measured by price & quality (non-price) competitiveness of its products, to improve on these aspects, a combination of demand management and supply side policies can be used. However, these policies options might cause significant trade-offs within the Singapore's economy.

Body

[P] Free trade agreements used to increase Singapore's price competitiveness might bring about structural unemployment in Singapore.

[E, E] Singapore focuses on exporting goods and services in which she has comparative advantage such as pharmaceutical and financial services. With lower opportunity cost in producing these goods and services, Singapore has price competitiveness in selling these products in global markets. To promote her exports competitiveness further, Singapore has signed Free Trade Agreements (FTA) with countries such as Europe and USA. She is also a member of the ASEAN Free Trade area. These free trade agreements will eliminate tariff barriers amongst member countries and will help to make Singapore's exports cheaper when sold in the markets of member countries, increasing Singapore's price competitiveness.

The forging of FTAs could also attract FDI from MNCs into Singapore. For example, an MNC from a non-ASEAN country with no FTA with ASEAN may wish to set up production plants in Singapore so that it can export from Singapore to other ASEAN countries, to take advantage of the waiver of import tariffs by other ASEAN countries when the good is exported from Singapore due to the ASEAN FTA.

[E, E] However, this will expose Singaporean firms to a higher level of international or regional competition. For Singapore, the forging of FTA could lead to removal of non-tariff barriers that lead to entry of foreign firms that supply services, into the Singapore market. Hence, industries which do not have the comparative advantage against similar industries in economies of the FTA or face a competitive disadvantage against foreign firms in the country, might face a reduction in their demand and the eventual need to reduce their demand for labour. These workers who are then unemployed might not have the skillset for other industries, leading them being structurally unemployed.

[L] Hence, while FTAs can bring about an improvement in price competitiveness of export for Singapore, it can also cause difficulties in term of structural unemployment.

[P] Supply-side policies such as the promotion of process innovation to improve price competitiveness might cause structural unemployment and the widening of the income gap.

[E,E] Singapore focuses on exporting goods and services in which she has comparative advantage such as pharmaceutical and financial services. With lower opportunity cost in producing these goods and services, Singapore has price competitiveness in selling these products in global markets. To promote her exports competitiveness further, Singapore has employed supply side policies such as the Enterprise Development Grant (EDG) by Enterprise Singapore. The grant subsidises firms to improve on their processes or to encourage adoption of automation to reduce the unit cost of production. While this will improve the price competitiveness of Singapore's export, it might cause workers whose jobs

are made redundant due to the increased automation of firms' processes. If these retrenched workers lack the relevant skill sets needed to manage the automated tasks or are unable to gain employment further up the value-chain, there will be an increase in structural employment, [L] causing difficulties for Singapore's economy. There will be people who can't find alternative jobs due to the lack of relevant skills. Moreover, those who have relevant skills that match the country's drive towards automation will enjoy rising wages. [L] Thus, the distribution of income in the country becomes more unequal.

[P] A low tax rate and building a well-connected infrastructure to attract FDI might lead to a worsening of the Singapore government budget position rising inequity.

[E,E] To build up a high level of attractiveness to foreign investors, Singapore maintains low business costs, a ready pool of skilled labour, and quality infrastructure for business operations. To attract investments, Singapore has a low corporate tax rate, and ensures ease of doing business through simplifying administrative processes and facilitating investments via government agencies like the Economic Development Board. Supporting the build-up of required infrastructure, including stable and affordable electricity and water supplies, also helps attract foreign businesses to set up operations in Singapore as having strong infrastructure networks helps to lower cost of production for firms. However, the fiscal spending to achieve these infrastructure projects are significant and prolonged. A low corporate tax environment might limit the fiscal budget the government can raise to finance such spending. In order to ensure a sufficient fiscal budget, the government might explore alternative tax revenue streams such as increasing the Goods and Service Tax (GST). As an indirect tax, it places a larger tax burden on lower income families as the tax will take up a larger proportion of their income, [L] resulting in greater inequity Singapore.

[Ev] While there are efforts to mitigate some of these effects by providing transfer payments such as the annual GST vouchers, Singapore faces a shrinking labour pool from an ageing population and in turn a shrinking tax pool by the government. Hence, the government will need to rely on increasing indirect taxes to finance its spending to improve global competitiveness. Over the long run, this will continue to place a disproportionate burden on lower income families in the economy. But this can be reduced via transfer payments targeted at poorer households, to off-set the effects of GST.

Conclusion

[Stand] Measures used by the Singapore government to improve global competitiveness will cause difficulties to a limited extent.

[Substantiation] Given Singapore's trade dependent nature and small domestic economy, measures that improves its global competitiveness can bring about significant macroeconomic benefits in terms of growth and employment. Furthermore, the extent of the difficulties caused by the policies can be determined by the nature of the chosen policies to improve global competitiveness. Policies that aim to improve the skills of the labour force should lead to a limited conflict as it can bring about inclusive growth while improving Singapore's BOT. However, policies such as FTAs and the promotion of process innovation, on their own, can lead to improvement in competitiveness while causing structural unemployment.

Overall, the difficulties from the measures employed by the Singapore government will generally be limited. This is because the government can consider using a right mix of policies such as the promotion of process innovation while retraining workers in the relevant skills to minimise the structural unemployment that arises from the former.

Mark Scheme

Level	Descriptor	Marks
L3	Well-developed explanation of at least 2 policies undertaken by the Singapore economy and explanation of the difficulties Singapore might face as a result of the implementation of these policies. Measures will need to address the improvement of price and non-price competitiveness AD-AS as the tool of analysis is applied.	8 – 10
L2	Under-developed explanation of at least 2 policies undertaken by the Singapore economy and explanation of the difficulties Singapore might face as a result of the implementation of these policies. Measures only address the improvement of price or non-price competitiveness AD-AS as the tool of analysis is applied but with conceptual errors	5 – 7
L1	Some knowledge on global competitiveness and policies that bring about improvement in global competitiveness (mere listing, largely unexplained). Answer is largely one sided: 1) Does not show how the measures may cause difficulties 2) Answer is largely focused on the limitations of the various policies.	1 – 4
E3	For an analytically well-reasoned judgement on whether the policies cause difficulties for Singapore's economy. Answer takes into consideration the type of policies implemented to achieve growth, the nature of Singapore's economy to come to a judgement. Note: Nature of economy will be relevant when candidates consider: i) depreciation stance monetary policy as one of the policies to improve competitiveness of exports and the EV is that it is likely to lead to difficulties due to it causing cost-push inflation, assuming ceteris paribus. ii) letting in foreign labour to lower unit labour cost and improve export price competitiveness and the EV is that it will lead to over-crowding	4 – 5
E2	For an answer that makes some attempt at a judgment on whether the policies led to difficulties for Singapore's economy.	2 – 3
E1	For an unsupported statement about whether the policies led to difficulties for Singapore's economy.	1

Markers' Comments

SKILLS

Question interpretation

- This question was poorly attempted. Most responses did not understand the full requirements of the question (i.e. how the measures to improve global competitiveness can lead to trade offs/conflict with other macroeconomic goals)
  - Irrelevant responses focused on explaining how policies can increase AEG and the limitations of the policies.

Analytical & Contextual Explanation (e.g. choice of arguments, adequacy of rigour, choice of examples)

- For a question like this, students should expound 2 policies in *detail,* and students should provide scope in terms of policy choice - not just focus on SS-side policies.

CONTENT (Major misconceptions)

- Some students wrongly applied the tariff diagram and directly applied it to exporting countries, i.e. Singapore, when explaining the gain in export competitiveness.
  - The tariff diagram is used to show the outcome of an economy when import tariffs are reduced. The tariff diagram is hence not very useful in this question (the focus is not on the impact of tariff reduction on the country) unless used to show

a fall in quantity supplied of domestically produced goods when explaining the structural unemployment problem.