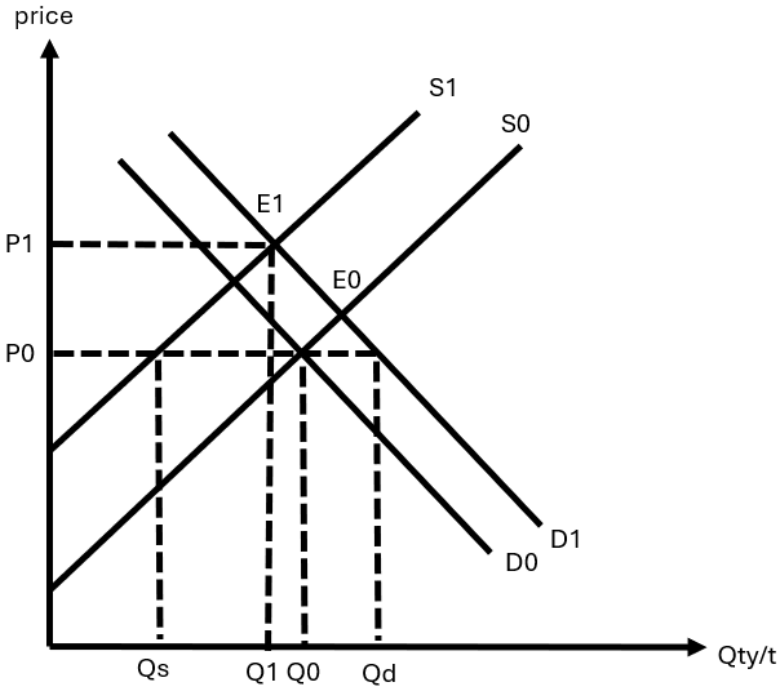
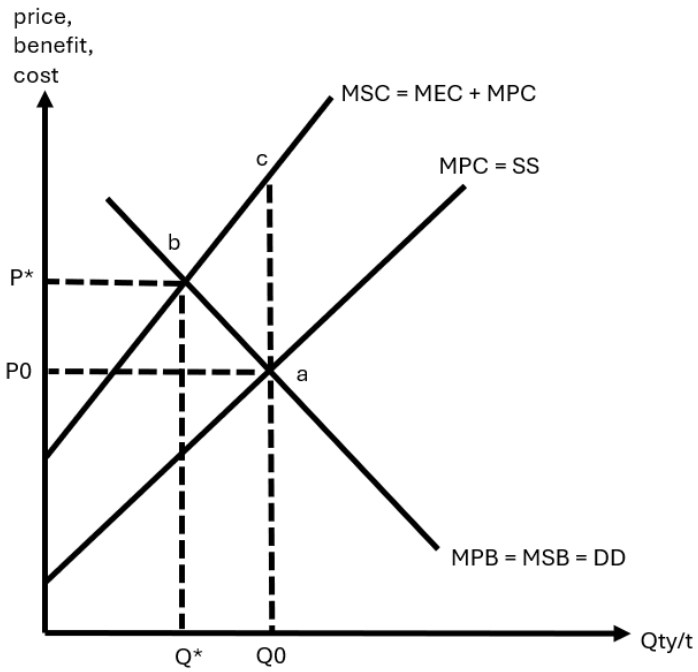
Answers and Marks Scheme to 2024 H1EC Prelim Exam

Question 1

(a)	**(i)**	**Describe the trend in the average selling price of graphics processing units (GPUs) from Q1 2019 to Q2 2022.** [General trend] The average selling price of GPUs experienced an overall increase from Q1 2019 to Q1 2022 [1]. [Refinement] However, there was a reversal of trend after Q3 2021, where the average selling price of GPUs fell from Q3 2021 to Q2 2022. [1]	[2]
	(ii)	**Using Extract 1 and a diagram, explain the observed trend in the average selling price of GPUs.** The rise in average selling price of GPUs is due to a fall in supply and rise in demand for GPUs. There was a rise in demand for GPUs due to the change in tastes and preferences of consumers. During COVID-19, consumers staying home bought more GPUs for gaming and crypto-mining, leading to a rise in willingness to purchase GPUs at all prices and hence increase in the demand for GPUs (rightward shift of the demand curve from D0 to D1). [1] There was a fall in supply of GPUs due to supply chain disruptions and shipping delays, causing a reduction in the number of units of GPUs producers were able to offer for sale at every price level. This resulted in a fall in the supply of GPUs (leftward shift of the supply curve from S0 to S1). [1] The rise in demand and fall in supply results in a shortage of (Qd-Qs) units at the initial equilibrium price of P0, resulting in an upward pressure on prices. [1] As price increases, quantity demanded will fall and quantity supplied will rise until equilibrium is attained at E1 where quantity demanded = quantity supplied at Q1, where equilibrium price has increased from P0 to P1. [1]	[5]

		 Diagram [1]	
(b)		**With reference to Extract 1, explain why a graphic processing unit has the characteristic of excludability.** According to Extract 1, a GPU commands a price. [1] This means one must pay to obtain the good. Non-payers are excluded from consuming this good. [1]	[2]
(c)		**Explain the likely impact of the introduction of software such as "cuLitho" on the total revenue of GPU producers, and comment on whether this is likely to hold in the future.** <u>Explain impact of "cuLitho" on TR of GPU producers [4]</u> With the introduction of "cuLitho", there would be a fall in the marginal cost of production of GPUs due to a speed up in computational lithography, leading to a rise in supply as GPU producers are now willing and able to produce more GPUs at every price level. [1] With a rise in supply, the resultant surplus would result in a fall in equilibrium price and a rise in equilibrium output. [1] The demand for GPUs is likely to be price inelastic due to a lack of close substitutes. As such, a fall in the price of GPUs would lead to less than proportionate rise in quantity demanded. [1]	[6]

		The fall in revenue from a fall in price thus outweighs the rise in revenue from a rise in quantity demanded, hence total revenue of GPU producers would have fallen. [1] Comment on whether this is likely to hold in the future [2] With the development of GPU substitutes such as SLIDE over time, the demand for GPUs will become less price inelastic or become price elastic instead. As such, we could see a smaller fall in total revenue or the resultant change in revenue might even be reversed and we could see a rise in revenue instead. [2] *Accept any other factor that questions the ceteris paribus assumption e.g. entry of new firms over time → increase in SS.*	
(d)	**(i)**	**Explain how a rational firm uses the marginalist principle to decide how many units of semiconductors to produce.** [Explain Marginalist Principle] A rational firm aims to maximise net total benefit (i.e. total profits) by making use of the marginalist principle, weighing the marginal benefit of producing semiconductors against its marginal cost. [1] [Explain MB and MC in **context**] The marginal benefit for the firm would be the revenue received from the sale of an additional unit of semiconductors, and the marginal cost would be the cost of the factors of production used in the production of an additional unit of semiconductors. [1]	[2]
	(ii)	**With reference to Extract 4 and using a diagram, explain why the price mechanism could lead to an over-production of semiconductors.** [Explain source of MF in context] In the production of semiconductors, negative externalities are generated. The production process involves the release of industrial wastewater into public waterways. As such, third parties who are not involved in the production of semiconductors could incur medical costs due to the water pollution. These negative externalities result in a divergence between the marginal private cost (MPC) and marginal social cost (MSC). [1] [Private vs social optimum] Profit-maximising firms only consider their marginal private benefit (MPB) and marginal private cost (MPC) in the production of semiconductors. They disregard MEC and supply according to MPC. The free-market equilibrium output Q0 is where DD (MPB) = SS (MPC). [1] The socially optimal output Q* is lower, where marginal social benefit (MSB) = MSC, which is where society's welfare is maximised. There is thus an overproduction of (Q0-Q*) units of semiconductors. [1]	[5]

		[Welfare loss to society] From output Q* to Q0, the additional cost to society (area Q*bcQ0) is greater than the additional benefit to society (Q*bcQ0), hence resulting in a welfare loss of abc, meaning that there is allocative inefficiency. [1]  Diagram [1]	
	(iii)	**Discuss the appropriateness of the government policy of incentivising innovation in the semiconductor industry to improve societal welfare.** <u>Introduction</u> From d(ii), there is a loss in societal welfare and hence allocative inefficiency in the semiconductor industry due to the negative externalities arising from semiconductor production. <u>R1: Explain how government policy to incentivise innovation in the semiconductor industry can improve societal welfare</u> [P] The government may decide to implement a policy to incentivise innovation in the semiconductor industry, which would lower the negative externalities generated and hence improve social welfare. [EE] The government may choose to provide research and development (R&D) grants to semiconductor firms to encourage their R&D efforts in the area of clean production. In doing so, this would lower the cost of conducting R&D for firms, which would incentivise them to increase R&D efforts in the area of clean production, as the MC of doing R&D now becomes lower than the MB of doing R&D (i.e. the expected rate of return on the R&D efforts).	[8]

[EE] If firms' R&D efforts are successful, cleaner methods are invented and these methods are cheaper than the old methods, firms will be incentivised by the latter to switch to newly developed cleaner methods of production. With a reduction in MPC to MPC', supply rises to SS'. This would reduce the MEC generated in the semiconductor industry (from MEC to MEC'), hence the MSC falls and shifts downwards from MSC to MSC'. As a result, the socially optimal quantity increases from Q* to Q*' (where MSB = MSC'), leading to a smaller extent of overproduction of semiconductors and a smaller welfare loss of area xyz, [L] thus improving societal welfare.

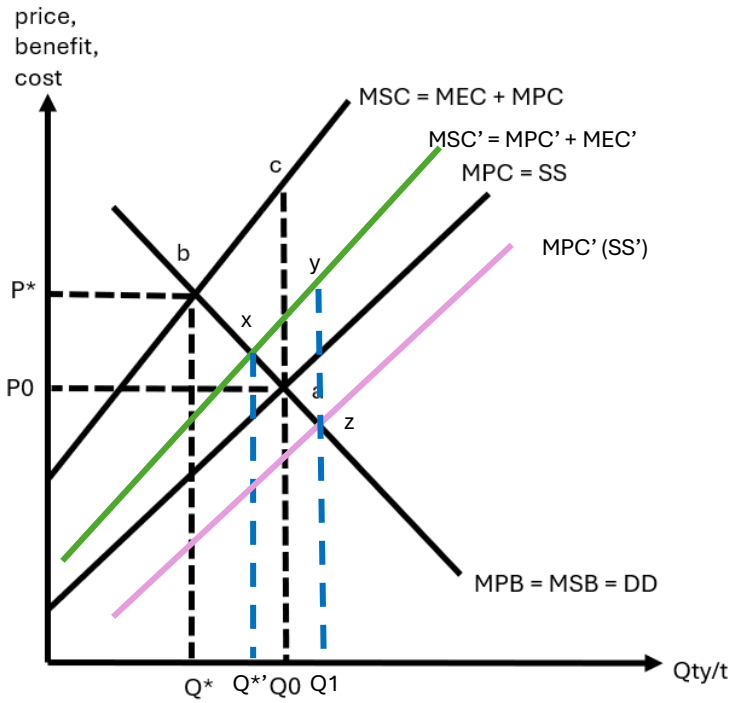


Figure 1: Market for semiconductors

R2: Explain limitations of the above policy, in terms of appropriateness

[P] However, there are limitations to such a policy that might affect its appropriateness in improving societal welfare.

[EE] Firstly, the outcomes of innovation efforts are uncertain. It is possible that substantial resources are pumped into research on the development of cleaner methods of production in the semiconductor industry, but with none of the research coming to fruition. Even if the research were to be successful, since R&D efforts take a long time, such a government policy would only be effective in the longer term.

[L] As such, given the uncertainty and long gestation period, government policy to incentivise innovation might not be appropriate in increasing societal welfare in the semiconductor industry, at least in the short term.

OR

[EE] Furthermore, a policy to incentivise innovation would almost certainly require government funding. There is an opportunity cost to spending government funds on firms' R&D efforts, for instance, the benefits to society's welfare that could have been attained had the funds been spent directly on healthcare (assuming it is the next best alternative foregone) instead. Further, governments in fiscal debt might find it difficult to even implement such policies, as they would have to borrow from financial institutions to fund their spending, which would lead to the crowding out effect, where the higher interest rates (as a result of the government increasing its demand for loanable funds) would disincentivise consumption and investment expenditure, leading to the unintended consequence of negative growth.

[L] Thus, depending on the government budget position, government policy to incentivise innovation might not be suitable in increasing societal welfare in the semiconductor industry.

<u>Evaluative Conclusion</u>

[Stand] Innovation is an appropriate policy. It is more appropriate in the long term, and could still be appropriate in spite of the high cost incurred. It could be more appropriate if additional measures like taxation were in place.
[Substantiation]
Any one of the following:

- [Effectiveness] Although it takes time, Samsung Electronics' success in developing "a Regenerative Catalytic System that treats processed gas with a specific catalyst to minimise carbon emissions at production sites" Extract 5 shows that efforts in innovation can be successful, albeit in the long term.
  A key advantage of the policy of incentivising innovation is that "technology to be the bridging solution between carbon reduction and growth.'' (Extract 4). Thus, semi-conductor firms are likely to be receptive to this policy since it enables them to produce more sustainably and at the same time win customers "amid the global turn toward environmentally friendly forms of production and growing sensitivity among consumers" (Extract 4) about the importance of sustainable production.
- [Time period] As explained earlier, innovation efforts take time to come into fruition; as such, in the short run, perhaps other more immediate policies can be implemented to improve societal welfare in the semiconductor industry e.g. production taxes, which would disincentivise semiconductor production, in turn reducing societal welfare.
- [Benefits vs cost] As highlighted earlier, this policy requires a high level of government spending and opportunity cost is incurred. However, if the benefits outweigh the costs, it is an appropriate policy.
- [Fiscal sustainability] Because this policy adds to the strain on a government's budget, this policy would be more appropriate if the govt also implemented pollution tax. Besides providing the added push for

firms to develop cleaner methods of production, it brings in the revenue to fund firms' innovation efforts in clean technology.

- [Government budget] Nevertheless, the appropriateness of the policy also depends on the fiscal situation of the country in question. A country like Singapore that has accumulated years of fiscal reserves would be in a better position to implement such a policy (that would require significant government spending).

Level	Description	Marks
L2	Answers in this level will provide cursory to developed (analytical) explanation of how a government policy to incentivise innovation in the semiconductor industry can improve societal welfare, as well as its limitations. Developed explanation of 1 of the 2 requirements score max of 5m.	4 – 6
L1	Answers in this level will have some limited understanding of impact of a government policy to incentivise innovation in the semiconductor industry on societal welfare. There will be limited/no consideration of the policy limitations. There is knowledge of concepts relevant to the question, but the question might not be addressed.	1 – 3
E	Evaluation marks will be awarded for a conclusion reached with respect to the overall appropriateness of the policy in question. Relevant case evidence and economic reasoning is used.	1 – 2

(e) **Discuss whether increasing minimum wages is the key solution to addressing rising income inequality brought on by the increasing adoption of AI in the workplace**. [10]

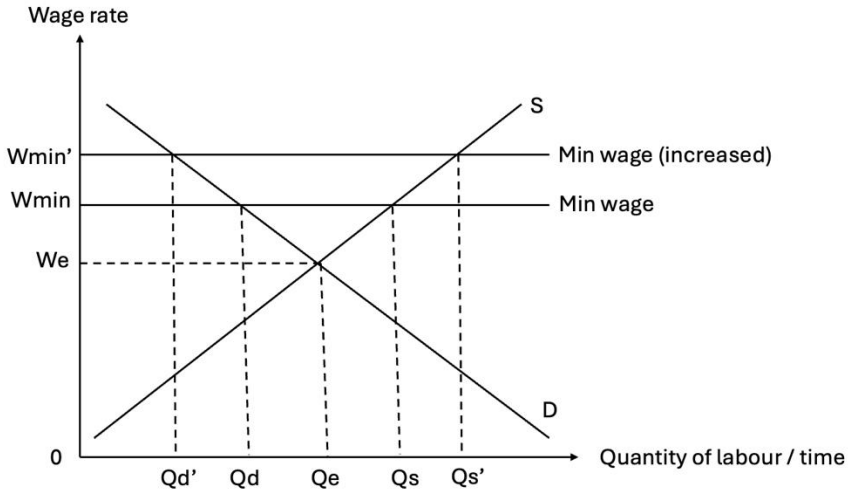
Introduction

From Extract 5, the increasing adoption of AI in the workplace has led to an increase in income and job opportunities for higher-skilled workers, but has also led to the redundancy of lower-income workers who work in manual or routine jobs that can be replaced by technology. The increased income inequality can have negative impacts on the standard of living of residents in a country. While raising the minimum wage is a possible solution to addressing the rising income inequality, other policies may be more suitable in doing so.

R1: Explain how increasing minimum wages addresses rising income inequality brought on by the increasing adoption of AI in the workplace

[P] Increasing the minimum wage can address rising income inequality due to increasing AI adoption in the workplace.

[EE] A minimum wage is the minimum hourly rate of pay for workers, enforced by law. With reference to the figure below, the government sets a minimum wage rate (at Wmin) above the market equilibrium wage rate (We). Raising the minimum wage via legislation from Wmin to Wmin' raises the wage rates of those who remain in employment (each of the Qd' units of labour is paid Wmin per hour).



[L] As such, the raise in minimum wage would lead to higher incomes for lower-income workers, thus reducing income inequality, ceteris paribus.

R2: Explain the limitations of increasing minimum wages

However, raising the minimum wage will lead to an increase in unemployment. Initially, the minimum wage at Wmin leads to a surplus of (Qs-Qd) units of labour, as the wage floor leads to a fall in Qd and rise in Qs of labour from the market equilibrium of Qe. With the increase in minimum wage to Wmin', there will be a further increase in quantity supplied of labour to Qs', and a further fall in quantity demanded to Qd'. This is because when price of labour rises, firms will substitute towards the use of machines involving the use of AI that is now relatively cheaper. This means that the excess labour has increased to (Qs'-Qd'), resulting in higher unemployment, evidenced by Extract 5 ("reducing the number of low-skilled jobs"). This may then defeat the purpose of the policy, as lower-income workers end up losing their jobs and income sources altogether, and income inequality may end up worsening.

Evaluative Conclusion

[Stand] All in all, raising the minimum wage is unlikely to be the key solution to reducing the income inequality that stems from the increasing adoption of AI in the workplace.

[Substantiation]

- [Unintended consequences] While raising the minimum wage is expedient and immediately effective in raising the wages of lower income workers, the ceteris paribus assumption is unlikely to hold. As explained earlier, raising the minimum wage would worsen unemployment, and it is likely that the workers that firms retrench are the lower-skilled (and hence lower-income) workers, who can more easily be replaced by machinery or technology. Thus, the policy is likely to "hurt the very group of people it intends to help, by reducing the number of low-skilled jobs" (Extract 5).
- [Root cause] In contrast, spending on skills upgrading of lower-income workers solves the problem at its root cause – where lower-income workers' skills become irrelevant from structural change. As such, skills upgrading is likely the key solution to reducing income inequality due to AI adoption instead. AI has the potential to affect all classes of workers (Extract 5). Blue collar workers and professionals will be made redundant. In contrast, the policy of minimum wage does not help those who have lost their jobs due to their displacement by AI. To improve income distribution, the solution ought to be reskilling so that the displaced workers can earn income by filling up jobs created by AI since "this extra wealth will generate the demand for many jobs" (Extract 5).
- [Time period] That said, as explained earlier, skills upgrading takes a long time, with uncertain results. Hence, in the shorter term, the government may have to intervene via other methods to reduce income inequality, such as by providing transfer payments targeted to lower-income households. It would also have to ensure the policy design effectively incentivises workers to take up these training programmes (or firms to send their workers for training).

Level	Description	Marks
L2	Answers in this level will provide cursory to developed (analytical) explanation of how raising the minimum wage and one other policy can help to reduce income inequality brought on by the increasing adoption of AI in the workplace. A developed explanation of only 1 policy (1 requirement) scores a max of 5m.	4 – 7
L1	Answers in this level will provide only knowledge of how raising the minimum wage and one other policy can help to reduce income inequality brought on by the increasing adoption of AI in the workplace.	1 – 3

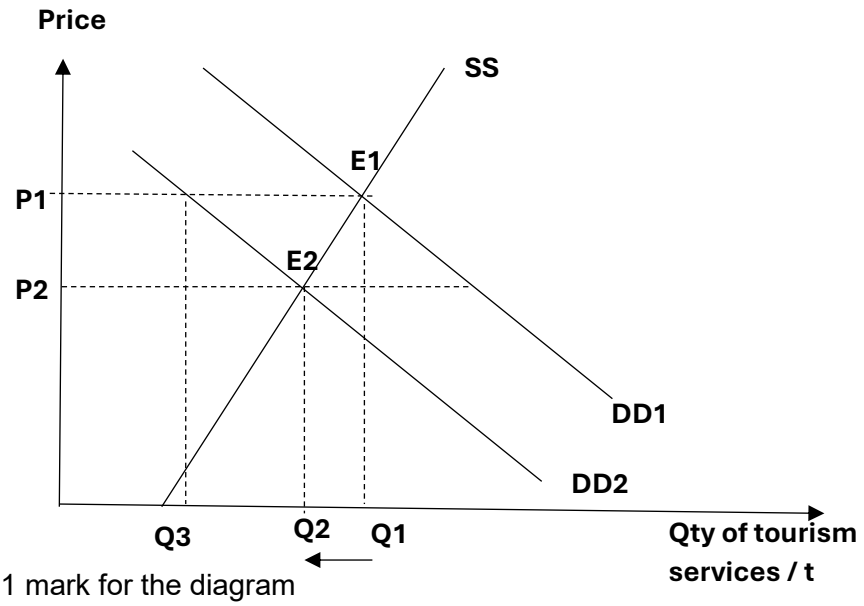
		E	Evaluation marks will be awarded for evaluative comment(s) made with reference to the overall relative appropriateness of each policy. Relevant case evidence and economic reasoning is used. A judgement must ultimately be made on whether raising the minimum wage is indeed the key solution to the problem mentioned. 1 generic, 1 contextual = 3	1 – 3	

Question 2

(a)	**Using Figure 2,**		
	(i)	**What is cost of living and describe the change in the cost of living in Singapore from 2018 to 2023.**	**[2]**
		DEFINITION • Cost of living is the cost of a basket of goods and services that provides a certain standard of living. • The *cost of living* refers to the **cost of** a basket of **goods and services required for maintaining a certain standard of living** in a particular location [1m]. Or • Cost of living is the general level of prices of goods and services measures in terms of a price index. INTERPRETATION Cost of living in Singapore has increased except in 2021 where it fell. [1m]	
	(ii)	**Explain how the real wage in Singapore change in 2023**	**[2]**
		• Real wage in Singapore **rose.** [1] • This is because **the nominal wage rate rose by more than the inflation rate** suggesting that **the purchasing power of the nominal wage had increased.** [1] **Or** • The % change in real wage can be estimated by taking the % change in nominal wage rate – inflation rate [1] • As there was generally positive growth in real wage from 2018 to 2022, real wage has increased [1]	

(b)		**With reference to Extract 6, explain two reasons why governments may be concerned with rising inflation and comment whether it is necessarily a concern for all governments.**	**[6]**
		One reason why governments should be concerned with rising inflation is that it may result in negative actual growth and a rise in unemployment. • When there is cost-push inflation, e.g. *Extract 6: Para 1, rising energy prices raise transportation costs,* which leads to a rise in unit cost of production, there will be a decline in profit margins will cause a fall in expected rate of return which could lead to a fall in investments. [1m] Or • The risk of declining real household consumption may reduce investors' confidence (Extract 6). This is because with falling real income, firms will face a fall in demand for their output leading to a fall in TR. Expectation of decreases in revenue leads to decreases in the expected rate of return of investment, which discourages investment. [1m] • Ceteris paribus, the fall in investments will cause AD to fall and national income decreases via the multiplier. This will result in the country experiencing negative actual growth and a rise in demand deficient unemployment. [1m] Another reason why governments should be concerned is that rising inflation disproportionately affects lower-income households (Extract 6, para 1). • Low-income households spend a very large proportion of their income on consumption. They have little savings. High income households on the other hand can afford to save a large proportion of their income. [1m] • When inflation rises, it becomes increasingly difficult for them to afford the same quantity of goods/services as before (inflation), they have to cut back on consumption causing them to have less access to goods and services. The rich on the other hand can continue to afford the same quantity of goods/services because even though their real income is also falling, they can spend out of their savings (dissave). Hence the rich are less adversely affected than the poor by inflation. [1m] Or	

		• Low-income household members tend to be the fixed income earners as they hold casual jobs / odd jobs / part-time jobs where wages are not indexed to the CPI (i.e. nominal wage doesn't rise with inflation). In times of rising inflation, their real income will be falling. [1m] • High income household members are high skilled workers who hold jobs with contracts that are likely to be indexed or they are represented by labour unions who ask for pay increases when inflation is on the rise inflation. In times of inflation, their real incomes thus might not fall as much as the low -income households. [1m] Comment (2m) However, for countries such as Indonesia, although it experienced rising inflation, the inflation rate is relatively low. The low level of inflation may encourage households to continue to spend, and consumption will rise as real interest rates are falling. The low inflation may also create a positive business outlook for firms and there may be a rise in their expected rate of return on investments, resulting in higher levels of investment [1m] The rise in C and I will cause AD to rise and generate actual growth [1m] **Students may also consider that for countries that export key commodities, the rise in price of these commodities due to supply chain disruptions will cause a rise in exports revenue and a rise profits for firms in these exporting industries. The government will be able to earn more tax revenue from these firms and use the funds to provide transfer payments to alleviate the impact of rising food prices on households.*	
(c)		**Singapore's neighbouring countries have employed new strategies to attract tourists [Extract 7].** **Using a diagram and the concept of price elasticity of supply, explain the impact of this phenomenon on the extent of change in the quantity of tourism services consumed by foreigners in Singapore.**	**[4]**
		If neighbouring countries successfully enhance their tourism appeal—whether through lower costs, improved infrastructure, unique attractions, or targeted marketing—these countries become more attractive substitutes to Singapore as a travel destination. As a result, tourists who might have otherwise chosen Singapore could be drawn to these alternative destinations, reducing demand for Singapore's tourism services [1m]. [Explain why foreigners are now *less willing* to pay for holidays in SG] The supply for tourism services in Singapore may be relatively price inelastic, when there is a fall in price, quantity supplied will fall by less	

		than proportionate, ceteris paribus. [1m] This is because these services involve hotel rooms, resorts and attractions that have fixed capacity. Building an attraction and new hotels in Singapore takes time and significant investment. Extract 7: "Total room inventory in Singapore has increased by just 4.6 per cent over the past five years" - making it difficult to respond to price changes [1m]. With the fall in demand and assuming supply remains constant, there will be a surplus at the initial price level, causing downward pressure on price, until a new equilibrium point is reached at E2. Given that PES <1, the fall in price leads to a less than proportionate fall in the equilibrium quantity from Q1 to Q2. [1]  1 mark for the diagram	
(d)		**Explain how a fall in foreign direct investment might lead to one type of unemployment while a rise in innovation-based investment (Extract 4) might lead to a different type of unemployment.**	**[4]**
		A fall in FDI will mean that investment levels have fallen in the economy. Since I is component of the AD, AD will fall, creating a downward multiplier effect on the country's GDP [1m]. Firms will cut back on production and will then reduce their demand for labour (since labour is a derived demand as an essential factor of production), leading to demand-deficient unemployment [1m] A rise in innovation-based investments will result in firms adopting new technologies and automating parts of their work processes to become more efficient [Extract 8: para 1: *adopting digital solutions across key job functions*]. Workers who lack the skills needed to adapt to these new methods of production, or find themselves displaced by automation will end up unemployed [1m]. The unemployed workers without the relevant skills may find it difficult to be employed since they suffer from a	

		mismatch of skills between what they have and what employers require as these new technologies '*create new job roles in the tourism industry*'. This results in structural unemployment. [Extarct 4, para 1] [1m]	
(e)		**Explain how two additional indicators can supplement Table 1 to enable a more accurate comparison of the change in living standards between countries.** To make accurate comparisons of changes in living standards between countries, one has to use **Gini coefficient**. An increase in real GDP per capita does not mean that all individuals in a country benefit equally from economic growth since there are bound to be inequalities in income distribution. The Gini coefficient helps to determine if there is equality in the distribution of the increased income. [1m] **A fall in the Gini coefficient value reflect an improvement in the income distribution** in Singapore. *This information together with the real GDP data* suggests *the rise in real GDP accrued to more people in the country.* Thus, one can more accurately conclude that the SOL for the average person in Singapore in 2022 had increased by more than in China. [1m] The **Pollution Standards Index (PSI)** is a tool used to measure the level of air pollution in a specific area, typically focusing on pollutants like particulate matter. Accurate PSI data allows for a clearer assessment of environmental quality and its impact on people's non-material well-being across different countries [1m]. By comparing changes in pollution levels, we can evaluate how environmental degradation or improvements affect the quality of life, complementing Real GDP per capita growth when assessing overall living standards between countries [1m] *Students may also bring in other indicators that will allow for comparisons of non-material SOL such as Life Expectancy or Average Working Hours per Year.* <u>Mark Scheme</u> 2m each to explain the additional indicator need. 1m for showing knowledge of the indicator (what it measures) and 1m for explain why it is needed. **Markers' comments** <u>Content</u> • Higher life expectancy due to greater consumption of healthcare is supposed to impact material SOL since there is the consumption of material goods. Same for the consumption of education. • The amount of leisure time is not really a SOL indicator as it cannot be formally measured. It would be better to use working hours instead.	**[4]**

(f)		**Discuss the extent to which a rise in governments' spending to increase in-bound tourist arrivals will result in higher living standards for residents of ASEAN economies.**	**[8]**
		Introduction: The ASEAN government's spending to increase in-bound arrivals will result in higher material living standards for most ASEAN economies, However, the extent of the rise in living standards may differ for different ASEAN economies depending on factors such as the value of tourism services as % of GDP. It also depends on the value of the country's currency relative to its rivals. **R1: A rise in ASEAN governments' spending to increase in-bound tourist arrivals will result in higher SOL for residents of ASEAN economies.** The ASEAN governments have increased spending on transport and hotel infrastructure [Extract 1, para 2. Vietnamese government's spending on high-speed railways and airports] and the development of tourism attractions [Extract 1, para 2: money being spent on the development of accessibility, attractions and tourist amenities]. Furthermore, some ASEAN governments, such as Indonesia, have provided grants for firms to develop tourism amenities that will increase the countries' investments in the tourism sector. The rise in government and investment expenditure will cause a rise in the aggregate demand for ASEAN countries. When the attractions and amenities are developed, the sector will attract a larger number of tourists to these ASEAN countries, which will further boost AD via exports of tourism services. The rise in AD from AD1 to AD2 will cause an unplanned fall in fall inventories and firms' production to restore inventories to their planned by hiring more factors of production, including labour. Households' incomes will increase, and the increase in purchasing power will induce higher consumption of other domestic goods and services. This is illustrated by a rise in AD from AD2 to AD3. The multiplier process will continue until real GDP increases from Y1 to Y4, assuming the economies have spare capacity. Assuming that the increase in real GDP exceeds the increase in population size, there will be an increase in real GDP per capita. The average ASEAN citizen now has greater purchasing power and can buy more goods and services. There will be a rise in material SOL. Furthermore, countries like Cambodia have developed tourism in the rural areas. A higher level of investment and job creation in rural areas could boost tourism. This will improve equity between the country's urban and rural dwellers as improvements in transport infrastructure, amenities, and employment in rural areas will translate to higher material SOL.	

R2: Govt spending to increase in-bound tourists may not result in a significant rise in SOL

<u>The extent of the rise in SOL depends on the value of tourism exports as % of GDP</u>

The extent of the rise in material SOL will depend on the size of tourism exports as % of GDP for the ASEAN countries. The increase in NY and material SOL will depend on the value of tourism exports as % of GDP. For countries such as Cambodia, Thailand and the Philippines, the travel and tourism sector contributes more than 20 per cent of the economy. However, for other ASEAN economies, this sector may only take up a small proportion of its GDP. For these economies, the development of tourist sectors will generally lead to higher tourist arrivals, but since the tourism sector contributes a little to the country's GDP, the overall impact on real GDP and SOL will be limited.

<u>The extent of the rise in SOL depends on the effectiveness of 'new strategies' that rival holiday destinations have implemented to boost their tourism sectors and whether these destinations are considered close substitutes.</u>

Another factor that may limit the overall impact on SOL is whether the ASEAN country has close substitutes as a tourist destination. Extract 8, para 2 mentioned that Singapore's neighbours are also 'employing new strategies' to attract tourists. As tourists deem these other countries as substitutes, 'new strategies' that will increase the attractiveness of the rival holiday destination in terms of cultural appeal or tourist attractions may result in a smaller rise in demand for tourism services in Singapore even after the government has spent to boost the tourism sector. This translates to a smaller increase in export revenue and a smaller rise in real GDP per capita and material SOL.

The higher costs and a strong Singapore dollar relative to the currencies of the other ASEAN countries in the region have led many tourists to switch to a lower-cost travel destination, as now tourism services are more expensive in Singapore in foreign currency. These factors may contribute to a smaller rise in tourist arrivals and a limited rise in exports of services and real GDP per capita.

<u>The increase in tourist arrivals may cause a decline in non-material SOL.</u>

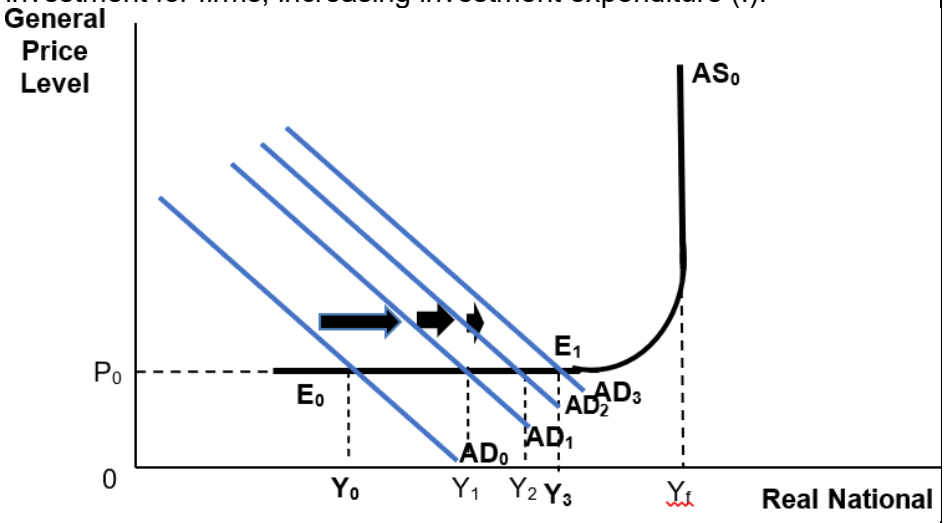
A negative externality occurs when the consumption or production of a good or service imposes costs on third parties not directly involved in the economic transaction. When there are too many tourist arrivals, it may lead to depletion of resources. Natural habitats, such as coral reefs or forests, may be damaged beyond repair, reducing biodiversity and affecting ecosystem services that benefit the local population. The tourists, who pursue their self-interest, will **disregard this external cost to third parties.** The degradation of the environment, which causes external costs *[Extract 5, para 2: unbridled tourism..was causing irreparable environmental harm*] will lower non-material SOL for the citizens.

Stand: The rise in government spending on tourism sectors will bring about a rise in living standards for the ASEAN economies to a large extent. Tourism has contributed significantly to employment and accounted for nearly 10 per cent of the region's GDP.

However, the impact on material SOL for the various ASEAN countries will depend on how dependent each of these economies is on tourism for its economic growth. It also depends on whether these countries are able to develop unique and attractive experiences that can lead to a substantial increase in tourist arrivals, which fuels economic growth. For the ASEAN country, which can successfully differentiate itself in the tourism market, attract high-spending tourists, and generate spillover benefits for other sectors of the economy, it will see a much larger rise in SOL.

In the case of the impact on non-material SOL, ASEAN countries such as Cambodia have embarked on environmentally friendly tourism. They may focus on minimizing the use of natural resources, such as water and energy. This prevents the overconsumption of resources that often occurs in heavily tourist areas. However, in countries such as Thailand, the government may not be able to manage the impact of over-tourism and environmental degradation, and therefore, the citizens may experience a rise in their non-material SOL.
Mark Scheme

Level	Description	Marks
L2	Answers in this level will provide cursory to developed (i.e. analytical) explanation of how the government's promotion of tourism may and may not lead to a rise in SOL. Developed explanation of 1 of the 2 requirements score max of 5m.	4 – 6
L1	Answers in this level will have some limited understanding of impact of the government's promotion of tourism on SOL. There is knowledge of concepts relevant to the question but the question might not be addressed.	1 – 3
E	Evaluation marks will be awarded for a conclusion reached with respect to the overall extent of rise in SOL (considering both material and non-material SOL). Relevant case evidence and economic reasoning is used.	1 – 2

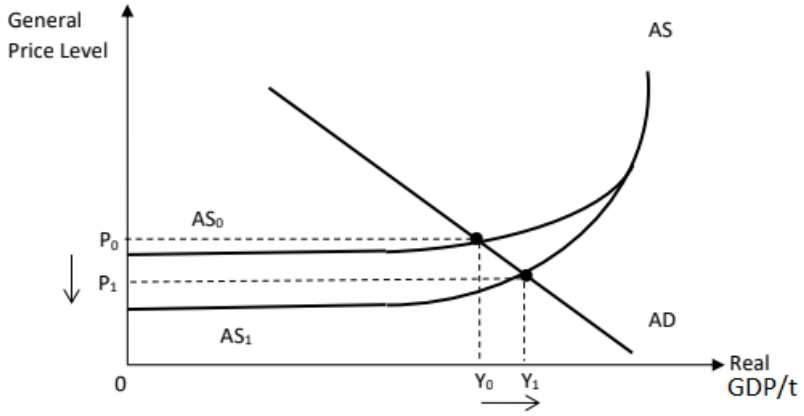
(g)		**Extract 6 highlights that China's Central Bank has implemented interest rate cuts whilst the Monetary Authority of Singapore has adopted an appreciation of the Singapore Dollar.** **Evaluate the appropriateness of the different monetary policy stance of China and Singapore**.	**[10]**
		Intro: China is experiencing slow EG while SG is experiencing cost-push inflation. **R1: Explain China's objective is to boost its domestic demand and stimulate growth.** An expansionary interest rate monetary policy via a decrease in interest rates could be an appropriate policy for China to adopt to stimulate its growth. The cut in interest rates will reduce the cost of borrowing and the returns to savings for consumers and firms. As households are now incentivised to borrow more to purchase big-ticket items and less incentivised to save, this will encourage more consumption expenditure (C). The fall in interest rates also increases expected profitability on investment for firms, increasing investment expenditure (I).  With slow growth in China, there is likely to be demand-deficient unemployment and hence spare capacity. The increases in C and I would lead to a multiplied increase in the aggregate demand (AD). This is represented by a rightward shift of AD curve from AD0 to AD1. The rise in AD will cause an unplanned fall inventories and firms' production to restore inventories to their planned by hiring more factors of production, including labour. Households' incomes will increase, and the increase in purchasing power will induce higher consumption of other domestic goods and services. The multiplier process will continue resulting in a multiplied increase in real GDP from Y0 to Y3. Therefore the expansionary monetary policy is able to address China's slow growth.	

Limitations

- Cuts in interest rates may not necessarily lead to rise in C or I if consumers / firms have a poor business outlook.
- Cuts in interest rates can lead to over-correction and lead to demand-pull inflation.

R2: Explain Singapore's objective is to contain its rising inflation

Singapore can mitigate cost-push inflation by using contractionary exchange rate monetary policy. Singapore is dependent on imported raw materials due to a lack of natural resources available domestically, making it likely to suffer from imported inflation such as due to rising cost of imported food. In order to curb imported inflation, the Monetary Authority of Singapore maintains a monetary policy of a long-term gradual and modest appreciation of SGD. An appreciation will cause a fall in the price of imported factor inputs in SGD terms and since most firms in Singapore rely on imported inputs, this will reduce the unit cost of production of goods and services, thereby leading to a rise in AS. This is shown in Figure 3 as a downwards shift in horizontal AS curve from AS_0 to AS_1, leading to a fall in GPL from P_0 to P_1, thus reducing cost-push inflationary pressure.



Therefore, an appreciation of currency is appropriate to tackle cost-push inflation for Singapore.

Limitation: However, Singapore may risk a weaker economic growth as they become less price competitive. An appreciation makes exports more expensive in foreign currency terms and imports cheaper in domestic currency terms. Assuming Marshall-Lerner condition holds, ie, the absolute sum of price elasticities for demand and supply is greater than one, (X-M), a component of AD, will fall, and with the reverse multiplier effect results in a large fall in RDGD.

<u>Conclusion</u>

Evaluation:

Stand: The monetary policy adopted is appropriate in solving the unique macro problems faced by China and Singapore but not adequately effective.

Substantiation: China's expansionary monetary policy is appropriate as it addresses the macro problem of weak growth which is sluggish rise in its AD. Since its inflation rate is falling and it has a weak demand, an expansionary MP to increase the AD would be appropriate. "China's economic growth recently slumped to one of its lowest levels in nearly half a century due to strict COVID-19 restrictions and a property market downturn (Extract 11). However, "lower interest rates have not translated into higher property sales so far due to the lack of confidence in large developers" (Extract 11). This suggests that households' economic outlook is still weak and the expansionary monetary policy might not be adequate.

Since Singapore is a small and open country whose trade is around 300% of her GDP, the control over her exchange rate is an important tool to manage the impact of the changes in external economy on her GDP. As highlighted in Extract 11, "intensified geopolitical conflicts could increase volatility in global energy and food prices". Thus, with likelihood of rising imported inflation, the appreciation of the SGD stance of MAS is the right move. Also, with the removal all its COVID-19 curbs and recovery of the tourism sector to recover to pre-pandemic levels by 2024, MAS is not too worried about the possible trade off of lowering inflation at the expense of causing falling AD from a falling (X-M) caused by a stronger SGD.

However, this may not be sufficient as the rise in GPL was due to domestic cost pressures like rising wages and high rental prices (Extract 11). Hence, strengthening the currency could still serve only as a short run measure; the government should strive to increase labour productivity to reduce the UCOP which targets the root cause of the problem.

Mark Scheme

Level	Description	Marks
L2	Answers in this level will provide cursory to developed (analytical) explanation of China's and Singapore's monetary policy could address their macro problems. A developed explanation of only 1 of the 2 country's monetary policy (1 requirement) scores a max of 5m.	4 – 7
L1	Answers in this level will provide only knowledge of interest rate and forex centred monetary policy or attempts at explanations are riddled with mistakes. The question might not be addressed.	1 – 3
E	Evaluation marks will be awarded for evaluative comment(s) made, with reference to case evidence and economic reasoning about the appropriateness of each country's monetary policy.	1 – 3