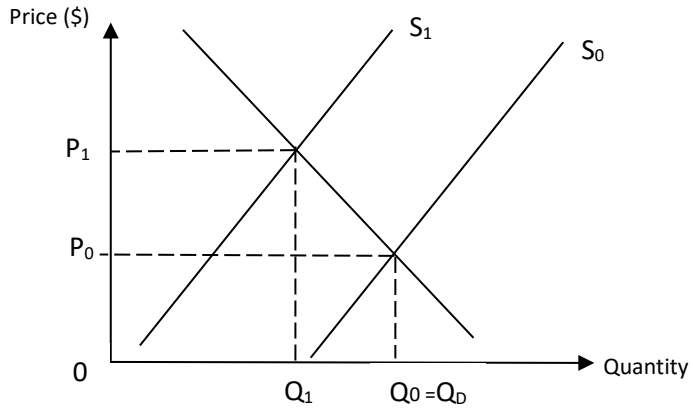
National Junior College
Economics Department

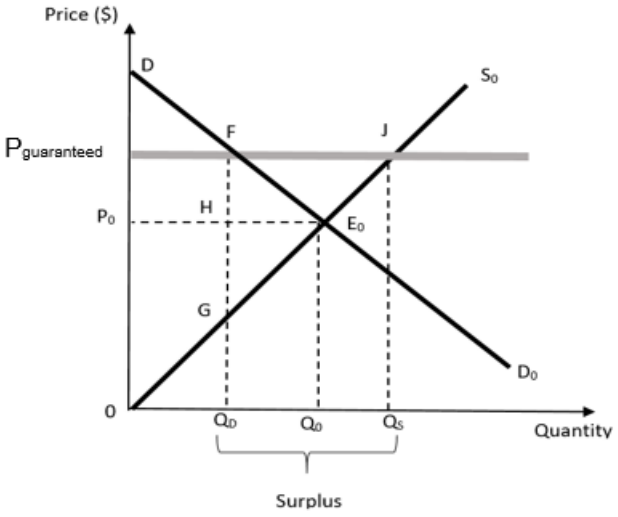
Preliminary Examinations 2025
Answer Booklet

Senior High 2
H2 Economics
(Syllabus 9570)

Paper 1 – Case Study Question 1

Questions & Suggested Answers

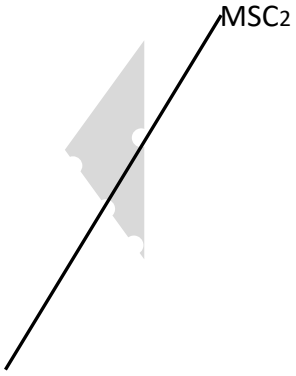
(a)	**With reference to Extract 1 and using a demand and supply diagram, explain how the rise in the price of cocoa led to the change in the price of chocolates.**	**[3]**
	● Increase in price of cocoa would lead to an increase in the cost of producing chocolate. This would result in a decrease in the quantity supplied of chocolate at each and every price, resulting in a leftward shift of the supply curve for chocolates. **[1]** ● As seen in the diagram below, the decrease in supply of chocolates would lead to an increase in price of chocolates from P_0 to P_1. **[1m]** ● **[1m for diagram]**  **Figure 1: Market for chocol** D_0	
(b)	**With reference to Extract 1, explain <u>two</u> strategies small confectioners, such as a boutique chocolatier, in Singapore used to increase revenue amid rising cocoa costs.**	**[4]**
	● **Strategy 1:** 4 One strategy is where price is increased if demand for chocolate remains price inelastic. If consumers view chocolate as a small indulgence**. [1]** 4 Hence the increase in price will lead to an increase in the firm's revenue. **[1]** ● **Strategy 2**: 4 The firm can aim to change consumers' taste and preference from the off-the-shelf chocolates to the more customized and DIY chocolates that they could experience and learn to make to cater to their own preferences. **[1]** 4 This will create higher demand for firms' chocolate sales, hence increase in total revenue. **[1]**	
(c)	**With reference to Extract 3,**	
(i)	**explain one negative externality that could arise from the production of cocoa in West Africa.**	**[2]**
	● According to Extract 3, current cocoa farming practices in West Africa involve extensive deforestation. "Land clearing increases emissions by releasing the carbon stored in forests; it also causes soil degradation, including the loss of organic matter, acidification, and loss of biodiversity". **[1]** ● The deforestation caused by cocoa farming imposes negative externality such as carbon emissions, which contribute to climate change and result in higher public expenditure on	

	healthcare and disaster response. These external costs resulting, which can amount to billions globally, are not borne by cocoa producers. **[1]**	
(ii)	**explain why cocoa would be over-produced in a free market.**	**[3]**
	● In a free market, producers only consider their marginal private benefits (MPB) and marginal private costs (MPC) from the production of cocoa. ● External costs arise from the production of cocoa and results in a divergence between the MPC and marginal social benefit (MSC)**,** where MSC is higher than MPC**. [1]** ● The free-market equilibrium occurs where MPB = MPC, while the socially optimal outcome occurs where marginal private benefit (assuming marginal social benefit equals zero) equals marginal social costs (MSC). **[1]** ● There will be an over-production of cocoa, where the market output of cocoa is greater than the social optimum level of cocoa produced**. [1]**	
(d)	**'While this guarantee provides a fixed price for farmers, they lose out when prices are high.' (Extract 2)** **Discuss the likely short-term and long-term impact of the fixed price scheme on cocoa producers in West Africa.**	**[8]**
	Introduction ● A fixed price scheme implemented by governments aims to guarantee a stable income for farmers. Similar to a price floor that is to guarantee a minimum price that is stable for farmers to support their incomes. ● This essay will explore both the short-run and long-run impacts of the fixed price scheme mentioned in Extract 2 on cocoa producers. **Body** **KR1: Short term impact of fixed price scheme on producers of cocoa in West Africa.** ● In the **short term**, the fixed price scheme provides *income stability* for cocoa producers, insulating them from volatile global price fluctuations. This guaranteed price acts similar to a **price floor**, offering a degree of certainty that can help farmers plan their finances and mitigate risks, especially when market prices are low.  Figure 2: Effects of a fixed price on cocoa producers ● Without government intervention, the free-market equilibrium price and quantity would be at P_0 and Q_0 respectively as shown in Fig2.	

	● Now, assume that the government sets a guaranteed price fixed at Pguaranteed to prevent the prices of cocoa from falling below a certain level to protect the incomes of the cocoa farmers. ● Given that the fixed price is set at Pguaranteed, cocoa farmers would get a revenue of area $P_{guaranteed}QFQ_D0$ from selling in the market. At the guaranteed fixed price schème, a surplus of Q_SQ_D exists which the government will buy up to ensure that farmers will still receive a stable income. Hence total income receive by the farmers will be higher at $P_{guaranteedJ}Q_S0$. ● However, if the government faces financial difficulties and find it difficult to continue to buy up the surplus from the farmers at the guaranteed price, the farmers may not benefit. **KR2: Long term impact of fixed price scheme on producers of cocoa in West Africa.** ● In the **long term,** the fixed price scheme can limit the profitability of cocoa production, especially when global market prices rise. When global prices surge farmers under the fixed price scheme are unable to capitalise on the price spike. Farmers receive lower total income despite high global prices, leading to lower income than would be possible under free market prices. ● When producers are unable to benefit from higher world prices, their potential profits are capped. Persistently lower profits reduce the ability of farmers to reinvest in their farms. This leads to falling productivity and output. ● In contrast, producers in more liberalised markets enjoy higher profit margins during price booms. This enables them to expand production, invest in technology, and achieve greater efficiency, making their cocoa more competitive globally. ● Over time, global supply chains may shift away from West African producers towards countries with more profitable and productive cocoa sectors. If the fixed price scheme is maintained for too long without adaptation, West African producers risk being marginalised, as they are less able to adjust their production methods or scale up investment in response to global price signals. Their cost structures remain inflexible, as the fixed price limits both revenue and the incentive to adopt more efficient, cost-saving technologies. Thus, while the fixed price scheme may offer short-term income stability, it can lead to long-term profit erosion, underinvestment, and a decline in global market share, unless complemented by reforms that improve productivity and cost competitiveness. ● However, given the volatility of agricultural prices, and changing consumers taste of preferences, cocoa prices might fall in the future. If the market price fall below the guaranteed price, farmers will stand to benefit from the income stability that the government has intended for the farmers. **Conclusion** ● Overall, while the fixed price scheme has **short-term b**enefits in cushioning farmers from price collapses, its **long-term** consequences may be detrimental. ● Given the rising trend of cocoa prices, the fixed price scheme tends to bring about more negative longer term impact on producers than it would benefit them.	
(e)	**Discuss whether the 'new EU law banning the import of commodities linked to deforestation' is the best way to reduce carbon emissions due to 'land clearing' in the production of cocoa.**	**[10]**
	Introduction ● The European Union Deforestation Regulation (EUDR) aims to reduce carbon emissions by banning the import of cocoa produced through deforestation or unsustainable practices. While this law aims to curb land clearing in cocoa production—a major source of emissions—it is important to assess whether it is the most effective approach, especially when compared to other methods such as implementing a carbon tax that directly targets the externality at source. ● This essay will consider both policy options and evaluate which is more effective in reducing emissions from cocoa farming. **Body**	

Key Requirement 1: Explain how the EU law as legislative intervention is effective in reducing carbon emission.

- As mentioned in c(ii), there is over-production due to negative externalities present.
- The EU Deforestation Regulation (EUDR) is a legislative intervention that seeks to reduce the external costs arising from land clearing in cocoa production.
- As shown in Figure 3, the marginal social cost (MSC) curve lies above the marginal private cost (MPC) curve, resulting in overproduction at output level Qp, where MSC > MSB.
- The EUDR requires importers to trace and verify that cocoa is sourced from deforestation-free land. By doing so, it encourages producers to adopt more sustainable farming practices. This reduces the external cost per unit of output, such as lower emissions and less environmental degradation.
- As a result, the MSC curve shifts downward, closer to the MPC curve, as shown by the movement from MSC_1 to MSC_2 in the diagram. The market equilibrium output Qp is now closer to the socially optimal level (Qs'), where MSC2 = MSB.
- This leads to a reduction in overproduction and an improvement in allocative efficiency, as fewer resources are devoted to environmentally harmful production



E_0

B

MEC

E_2

A

0

MSB = MPB

Q_s

Quantity of cocoa

Cost/ Benefit ($)

Q_p

MSC1=MPC+MEC

MPC

E1

Qs'

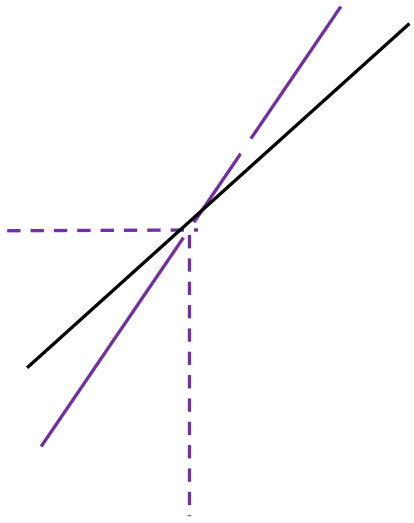
Figure 3: Impact of EU law on reducing carbon emission

- While theoretically effective, this legislation depends on enforcement and traceability. If large volumes of cocoa remain non-traceable, the regulation may not reduce actual emissions significantly.

Key Requirement 2: Explain how a carbon tax is effective in reducing carbon emission.

- An alternative to the EUDR is the imposition of a carbon tax on cocoa producers that engage in land clearing and deforestation.
- Carbon emissions from land clearing are a classic example of a negative externality in production. In the unregulated market, cocoa is produced at quantity Qp, where Marginal Private Cost (MPC) equals Marginal Private Benefit (MPB). However, the true cost to society, including environmental damage from carbon emissions, is higher—represented by the Marginal Social Cost (MSC) curve, which lies above the MPC.
- A carbon tax raises the cost of production for cocoa farmers who clear land or uses higher yield cocoa seeds or more productive methods of production, thereby shifting the MPC curve upward toward the MSC curve.
- This internalizes the externality: producers now face a cost that more accurately reflects the environmental damage they cause.
- The new equilibrium occurs at the socially efficient output level Qs, where MSC = MPB.

The reduction in output from Qp to Qp' decreases carbon emissions and eliminates the deadweight loss (area AE0E1), leading to a more allocatively efficient outcome.



Es

A

0

Ep

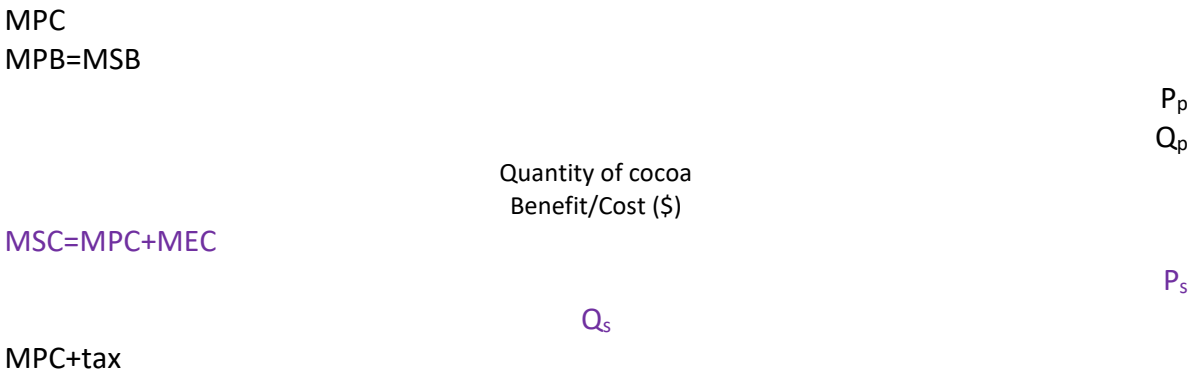


Figure 4: Impact of carbon tax to reduce carbon emission

- However, the effectiveness of this policy depends on implementation capacity in producing countries like Ghana and Côte d'Ivoire. With millions of smallholder farmers earning below market prices, a tax could lower already poor incomes earned by these farmers.

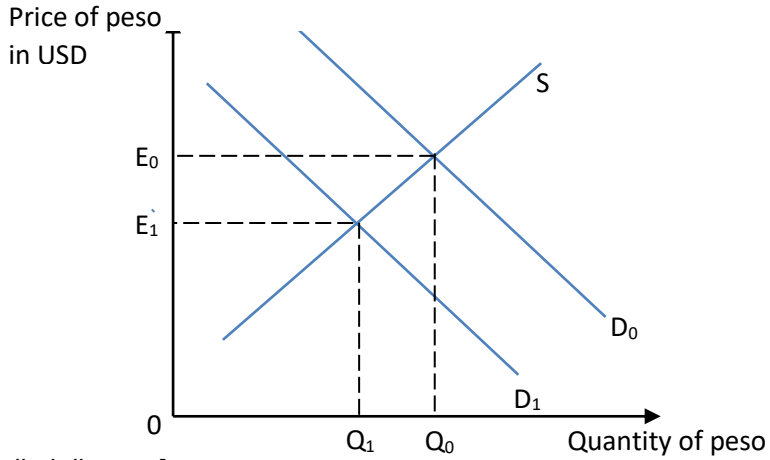
Conclusion

- The EU Deforestation Regulation (EUDR) is easier to implement than a carbon tax because it is enforced at the point of import rather than at the source of production. The EU can rely on existing customs and trade infrastructure to verify compliance through documentation (e.g. geo-tagged sourcing data), without needing to directly monitor farming practices in West Africa. This centralised enforcement makes the regulation more administratively feasible for a well-developed and powerful importing region like the EU.

Paper 1 – Case Study Question 2

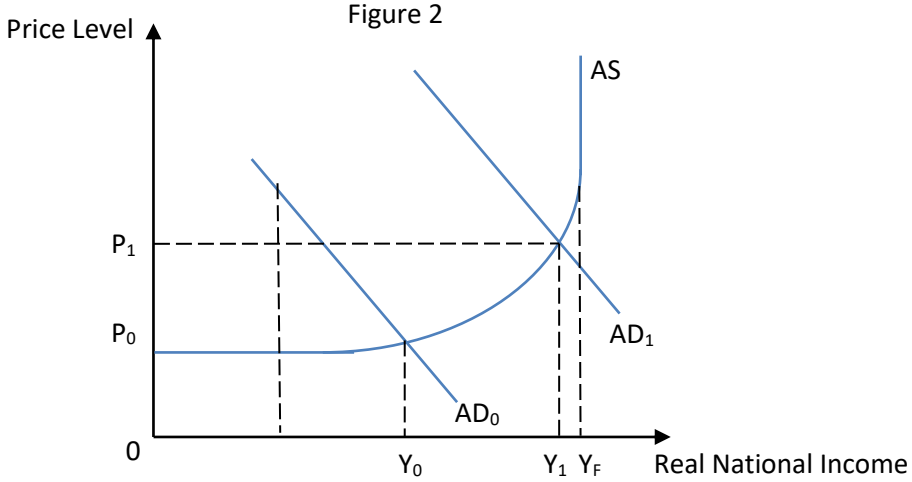
Questions & Suggested Answers

(a)	**With reference to Table 1, compare the change in the government budget balance as a percentage of GDP of Argentina with that of the US between 2018 and 2023.**	**[2]**
	Argentina's budget balance as a percentage of GDP showed a decrease in deficit, while that of US showed an increase in deficit. [1m] Both countries' budget balance as a percentage of GDP showed a sharp increase in deficit in 2020. [1m]	
(b)	**With reference to Extract 5, explain one reason why a high and rising government debt might cause economic growth to be unsustainable.**	**[3]**
	● As mentioned in Extract 1, "large debts could become a drag on the economy or precipitate a fiscal crisis". The government will then need to implement "sudden and economically painful spending cuts or tax increases" to reduce its debt. [1m] This is because the high government debt imposes a strain on the government budget in paying the interest or repaying the debt. Eventually, the government will need to cut spending or raise taxes to pay its debt. [1m] The increase in taxes will lead to a fall in consumption (C) or investment (I). At the same time, there is a fall in government spending (G). This leads to a fall in AD, [resulting in a multiplied fall in national income via the multiplier effect [1m] and thus fall in actual growth (or negative economic growth).	
(c)	**With reference to Figure 1 and Extract 6, and using a demand and supply diagram, explain how the drought in Argentina has affected the unofficial exchange rate of the peso.**	**[4]**

	● Figure 1 shows that the unofficial exchange rate of the Argentina peso has depreciated. [1m] ● The drought has resulted in a fall in Argentina's export revenue due to the fall in quantity of the agricultural exports. [1m] ● This leads to a fall in demand for the Argentina peso in the foreign exchange market as foreigners are spending a smaller amount on Argentina's exports, causing its unofficial exchange rate to fall to a new equilibrium E_1 as shown in the diagram below: [1m] Figure 1 – Market for Argentina Peso  [1 mark for fully-labelled diagram]	
(d)	**With reference to Extract 6, explain how Argentina's 'commitment to an overvalued currency peg' has caused a decline in its foreign exchange reserves.**	**[3]**
	● The 'commitment to an overvalued currency peg' suggests that Argentina is pegging the official exchange rate of the peso above the market equilibrium. [1m] ● The Central Bank had to "sell dollars to support the peso at the official rate". [1m] ● In order to maintain the exchange rate at the official rate, the Central Bank will have to buy pesos using its foreign exchange reserves. Hence this results in a fall in its foreign exchange reserves. [1m]	
(e)	**Discuss whether a devaluation of the peso is more beneficial or harmful to Argentina.**	**[8]**
	Introduction ● Explain the background for devaluation The worst drought in six decades has severely hurt Argentina's current account revenues due to the fall in its exports, putting downward pressure on the exchange rate of the peso. This has made supporting the peso at the official exchange rate unsustainable, as the Central Bank will be depleting its foreign exchange reserves to buy the peso. Hence, the government is planning to devalue the peso ie. lower the official exchange rate of the peso. **Body** **KR1: Devaluation is beneficial to Argentina** ● Devaluation of the peso will reduce the price of Argentina's exports in foreign currency, causing the exports to be cheaper in overseas markets. This leads to an increase in demand for Argentina's exports, thus increasing its export revenue. ● Assuming Marshall-Lerner condition holds, the devaluation will lead to an improvement in balance of trade and thus an increase in net exports (X-M). ● The leads to an increase in AD, which will result in a more than proportionate increase in national income through the multiplier effect.	

- As shown in Fig 2, the increase in AD causes national income to increase from Y0 to Y1, hence achieving actual economic growth.

Figure 2

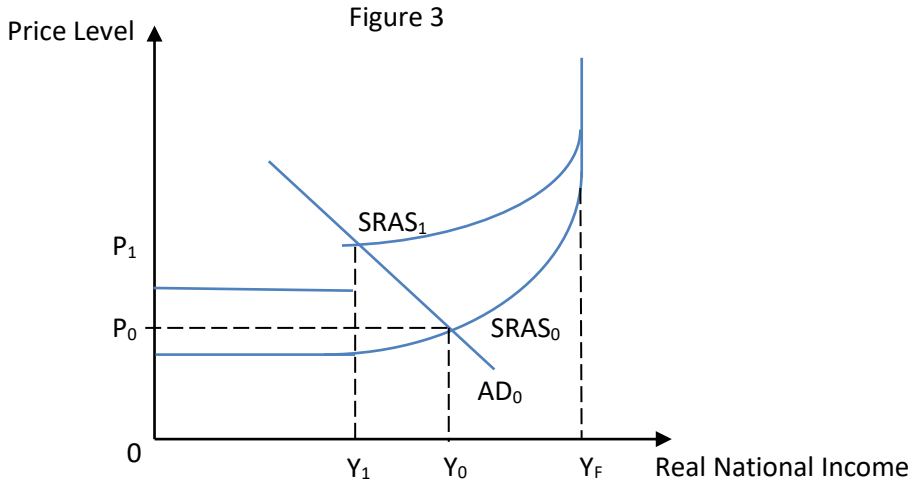


- The benefit of devaluation is dependent on the price elasticities of demand for imports and exports. In the short run, the price elasticity of demand for exports and imports may be very low. Moreover, it takes time for firms to adjust their demand for imported inputs and source for new suppliers. This means that Marshall-Lerner condition may not be met, and the devaluation may lead to a worsening of the trade balance instead.

KR2: Devaluation is harmful to Argentina

- The devaluation of the peso makes imports more expensive in the home currency. The higher price of imported inputs will mean an increase in cost of production for firms. This is shown by a fall in SRAS in Figure 3, causing a rise in price level from P0 to P1, thus resulting in cost-push inflation or import price-push inflation.

Figure 3



- At the same time, there is a fall in real national income from Y0 to Y1.

Conclusion

- While there could be some short-term pain such as higher inflation arising from devaluation, it is likely to be of benefit in the longer term as the economy stabilizes and the central bank is able to build up its foreign exchange reserves again so that it is better positioned to handle any economic crisis.

(f) **Both the US and Argentina governments have proposed measures to balance the government budget through spending cuts and raising taxes.**

Discuss whether such measures to balance the government budget are more appropriate for the US than for Argentina. **[10]**

Introduction

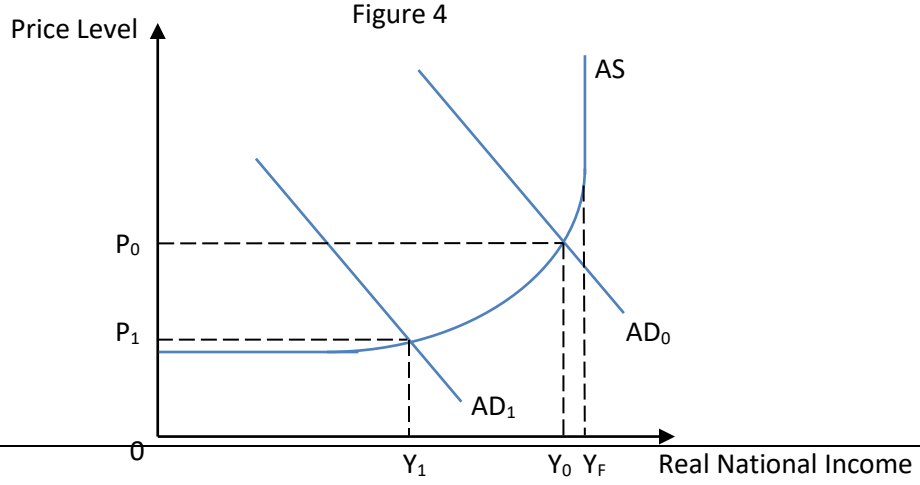
- Both US and Argentina have been incurring government budget deficits over the years, as shown in Table 1, and accumulating high government debts.
- This can have a detrimental effect on the economy and welfare of the population if left unchecked.
- There may thus be a need for both governments to adopt measures to balance their budgets and reduce their debt. However, such measures could result in trade-offs in terms of other macroeconomic objectives that could also negatively impact the well-being of the people, and thus may not always be appropriate.

Body

KR1: Measures to balance the government budget are appropriate for the US

- As shown in Table 1, the US government budget deficit as a percentage of GDP has been rising over the years (from 2018 to 2023).
- The high and increasing budget deficit means that the US government is accumulating a larger and larger government debt.
- The high and rising government debt is a concern as it could have detrimental effects on the economy because when the debt gets too high, it could cause a loss of investor confidence. A government default on debt payment could trigger a financial crisis and cause economic collapse.
- The loss of investor confidence and increase in borrowing cost cause firms to reduce their investment spending as they expect lower profits or returns on their investments. This causes a fall in I and thus a fall in AD, triggering a multiplier effect, which results in a more than proportionate fall in national income from Y0 to Y1 as shown in Fig 4.

Figure 4



- It is therefore appropriate that the US government adopt measures to balance its budget, so as to reduce its government debt and preserve investor confidence to avoid the negative effects on the economy.
- The measures may not be appropriate for the US due to its 'unique position in the global economy'. As the US dollar is the world's reserve currency, there is high domestic and international demand for the US dollar. The strong confidence in the value of the dollar means that investors are willing to hold US dollar-denominated assets such as Treasury bills at low interest rates. This means that the government can continue to borrow to finance its budget deficit without incurring higher borrowing costs and causing loss of investor confidence. The economically painful measures of spending cuts and increasing taxes are thus unnecessary.

KR2: Measures to balance the government budget are appropriate for Argentina

- Argentina is experiencing high inflation hitting 161%, as well as persistent government budget deficits as shown in Table 1.
- A persistent government budget deficit could have a negative impact on investor confidence and lead to economic decline due to a fall in investment. It is thus appropriate for the government to reduce its debt by implementing spending cuts and raising taxes to balance its budget. This will help to boost investor confidence, and hence stimulating economic growth.
- As mentioned in Extract 3, out-of-control government spending was seen as the root of Argentina's economic problems. Reducing government spending would thus be appropriate in tackling the root cause of the high government debt. The policy is also supported by the IMF, which said that its implementation "will help stabilise the economy and set the basis for more sustainable and private-sector led growth".
- It is thus appropriate for Argentina to adopt measures to balance the government budget by reducing government spending and/or increasing taxes.
- As explained above, the spending cuts lead to a fall in G, while the increase in income tax or corporate tax rates will cause a fall in C and I respectively. These lead to a fall in AD which causes further multiple shifts in AD via the multiplier effect.
- Referring to Fig 4, the fall in AD causes a fall in general price level from P0 to P1, thus helping to reduce the inflation rate in Argentina.
- The cut in government spending and increase in taxes will have a contractionary effect on the economy and lead to a fall in AD and fall in national income, resulting in recession. This is particularly a concern for Argentina as its economy is already weak. Table 1 shows that Argentina is already experiencing a recession in 2023. As mentioned in Extract 3, 'the government spending cuts will derail economic growth' and a recession is unavoidable. The measures to balance the government budget are thus inappropriate as they will worsen the recession that the economy is experiencing.

Conclusion

- Comparing between the 2 countries, it could be argued that the measures to balance the government budget are <u>more appropriate for the US than for Argentina</u>.
- This is based on the existing conditions in the two countries. As the US government debt is already at a historical high and increasing over the years, it is more likely to reach the tipping point where investor confidence could be undermined. Argentina's budget deficit as a percentage of GDP is relatively lower than the US, and has been declining over the years, as shown in Table 1. It is thus less likely to be a concern to investors.

Paper 2 Section A – Essay Questions

1 In February 2024, Health Minister Ong Ye Kung announced that about 29,000 nurses are set to receive up to $100,000 in payouts under a new long-term retention scheme for nurses working in the public healthcare system. However, the shortage of nurses in Singapore is set to remain, due to insufficient work-life balance for healthcare workers and an ageing society.

Source: The Straits Times, February 2024

(a) Explain why there is a shortage of nurses in Singapore and why a surge in their wages is needed. [10]

(b) Discuss possible measures that could alleviate the surge of nurses' wages in Singapore. [15]

Part (a) suggested answer

KR1: Explain why there is a shortage of nurses in Singapore

- Demand factor:
  - With an ageing population in Singapore, there will be an increase in demand for healthcare related services due to a higher prevalence of chronic diseases, a greater need for long-term care, and a greater reliance on healthcare systems for support.
  - As a result, the demand for nurses increases as nurses are needed to support the demand for healthcare services (e.g. providing assistance to doctors and care for patients).
  - With the increase in the quantity demanded of nurses at every wage level, the labour demand shifts right from DD_0 to DD_1 in Figure 1.
- Supply factor:
  - At the same time, there is a fall in supply of nurses due to the lack of work-life balance for healthcare workers. Hence, there is a fall in the quantity supplied of nurses at every wage level, and labour supply shifts left from SS_0 to SS_1 in Figure 1.
- Shortage:
  - With reference to Figure 1, there is an increase in demand and fall in supply of nurses. Hence, there is a shortage.

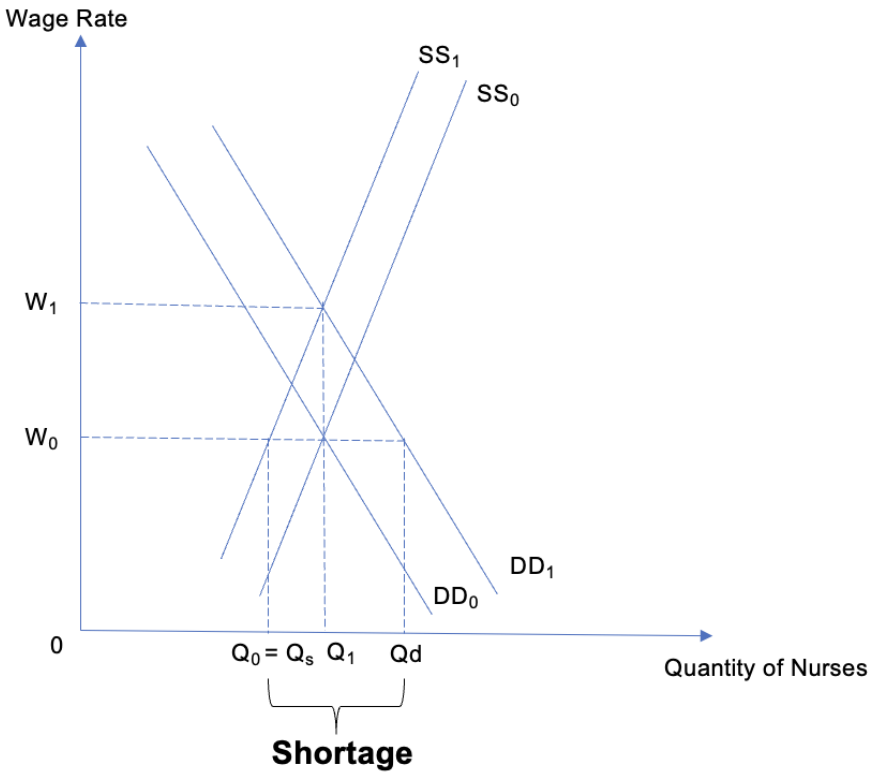


Figure 1: Shortage of Nurses in Singapore

KR2: Explain why a surge in the wages of nurses is needed

- With reference to Figure 1, wages rise from W_0 to W_1.
- In this case, wage rate has surged / risen rapidly due to the price inelasticity of the supply.
- The supply of nurses is price inelastic as it takes time to train nurses. As a result, there is a surge in the wage rate of nurses.

Conclusion

- The shortage of nurses is caused by both the increase in demand for nurses and the fall in of supply of nurses.
- With price inelastic labour supply of nurses, there is a need for a surge in the wages of nurses.

Part (b) suggested answer

Introduction

- To alleviate the surge of nurses' wages, the government needs to concurrently address the shortage (by increasing supply of nurses and reducing demand of nurses), and influence the price elasticity of demand and supply of nurses to be less price inelastic.

KR1: Supply measure to increase SS and PES of nurses in Singapore

- Manpower policies to allow entry of more foreign nurses to make up for the shortfall of local supply of nurses. For instance, the Singapore government could provide incentives for nurses to attract them to work in Singapore, such as accommodation support, retention bonuses, and professional development opportunities. This would increase the quantity supplied of nurses at every wage level and increase the supply of nurses.
- By increasing cross-border geographical mobility, the supply of nurses becomes more price elastic as by giving incentives to attract more nurses to Singapore, more foreign nurses will be willing to work in Singapore when wages increase.

As explained in Figure 1 in part (a), there is a surge in wage from W_0 to W_1 due to the shortage caused by the fall in supply and rise in demand. With the increase in supply of nurses and supply becoming more price elastic, the labour supply of nurses shifts right from SS_1 to SS_2 (Figure 2), alleviating the surge in wages as wages would fall from W_1 to W_2.

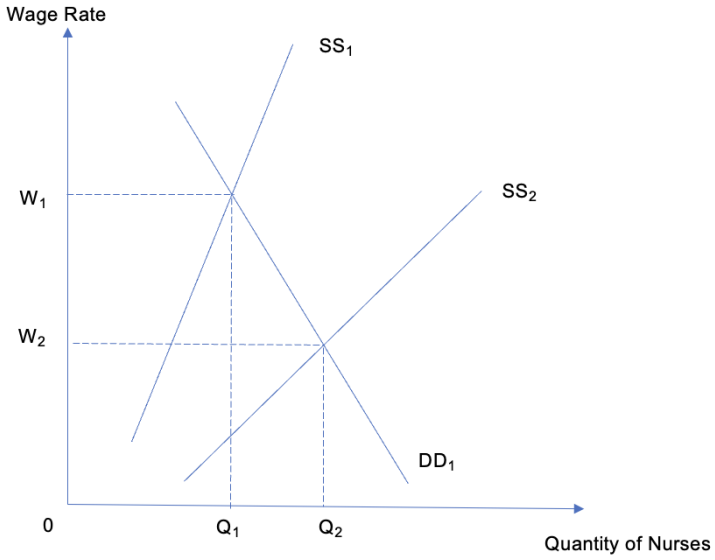


Figure 2

However, the surge in wages might not be alleviated much (only fall a small extent) as:

- Foreign nurses might prefer to relocate to other countries where it is easier to obtain access to permanent residency, or where there are more attractive financial incentives. As an ageing society is a phenomenon faced in many developed countries, the competition for the pool of foreign nurses is likely to be strong. Hence, the supply of nurses and geographical mobility might not increase much.

KR2: Demand measure to reduce DD and increase PED of nurses in Singapore

- With advancements in technology / as technology is adopted on a larger scale, the cost of utilising technology in healthcare services for job scopes traditionally covered by nurses can be done by automation is lower. It is hence more economically feasible for hospitals to replace the work traditionally done by nurses with technology. For instance, patients in the smart wards in Singapore General Hospital who need frequent monitoring of vital signs get medical-grade wearables that read minute-by-minute vitals, relieving nurses of these tasks. At the National University Hospital, there are also trials being conducted for robot nurses to monitor patients' condition and issue medicine. This will reduce the demand for nurses as they are substitutes.

- As the use of technology increases the degree of substitutability for nurses when the workload of nurses can be replaced by technology, the demand for nurses also becomes more price elastic.

As explained in Figure 1 in part (a), there is a surge in wage from W_0 to W_1 due to the shortage caused by the fall in supply and rise in demand. With the reduction of demand of nurses and demand becoming more price elastic, the labour demand of nurses shifts left from DD_1 to DD_2 (Figure 3), alleviating the surge in wages as wages would fall from W_1 to W_2.

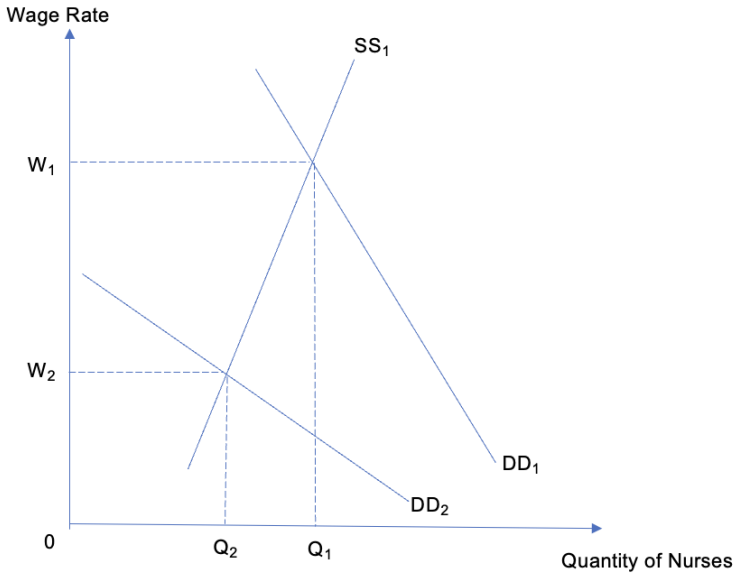


Figure 3

However, the surge in wages might not be alleviated much (only fall a small extent) as:

- Technology cannot serve as a close substitute for nurses, as there is a limit to which medical-grade wearables and robot nurses can replace the human touch in such professions of care.

Conclusion

Given the complexity of the problem where the root causes include both demand and supply factors that lead to the shortage of nurses and a surge in their wages, a combination of measures to increase the supply (and PES) and reduce the demand of nurses (and increase PED) would be necessary.

2 Air India announced its merger with smaller rival airline Vistara in 2022. India is the fastest growing global economy, and demand for air travel is surging with passenger traffic expected to more than double over the next 10 years. The combination of Air India and Vistara would bring significant synergies. Another strategy to increase profits would be price discrimination.

(a) Explain why a profit-maximising firm's decision to shut down or expand its output in the short run depends on its costs and revenue. [10]

(b) Discuss whether merger or price discrimination is the more appropriate strategy for an airline firm to increase its profits. [15]

Part (a) suggested answer
Introduction

- A profit-maximising firm's decision to shut down or expand its output depends on its costs and revenue in the short run.
- Cost consideration: In general, the firm's decision to shut down in the short-run (when facing subnormal profit), is based on the shut-down condition that TR ≥ TVC for the firm to continue production ie. the firm should shut down if TR < TVC.
- Revenue consideration: A firm should expand its output if MR>MC as there are still additional profits to be earned by increasing output.

Body
KR1: Shut down - consideration of revenue and costs

A firm will consider shut down if there are changes to demand/ costs that led to subnormal profits.

Whether the firm will decide to shut down in the short-run will depend on whether its total revenue is able to cover its total variable cost.

<u>Scenario 1:</u> Subnormal profit and **AR< AVC – shut down**

1. The firm should shut down if it is making subnormal profit and its TR < TVC or AR < AVC

- If the fall in demand is so great that the firm's revenue is unable to cover its variable costs, then it should shut down.
- This is because the **loss will now be greater than its fixed costs**. As its total revenue is not able to cover its total variable costs, it means that the **total loss now includes both** its **total fixed cost** as well as **part of the total variable cost that is not covered by its revenue.**

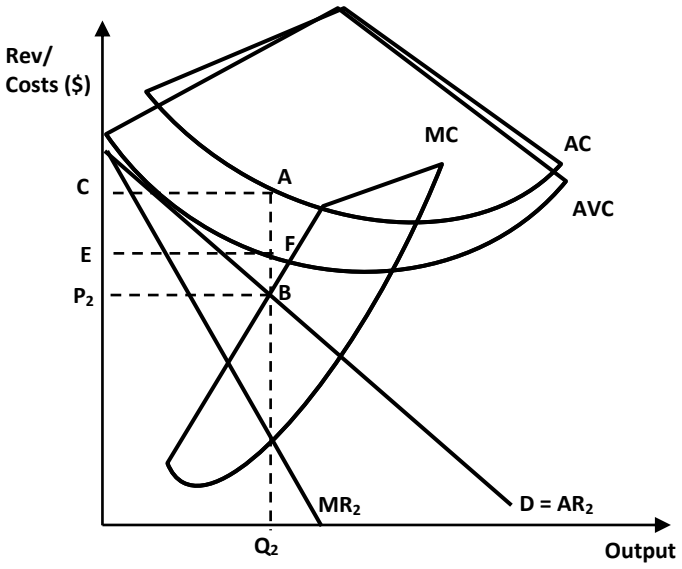


Fig 1 – AR < AVC

- At the new profit-maximising output of Q_2 where MR_2=MC, the firm charges a price of P_2 which is now lower than AC and AVC.
- Since **AR<AVC, the firm will shut down** because it is not only **earning a subnormal profit**, it **also cannot cover its variable costs**.
    - **If it continues production, its loss is P_2CAB**, which is equal to both its **fixed costs and part of the variable costs not covered by its revenue**.
    - **Shutting down** would result in a **smaller loss of ECAF which is its fixed cost, compared to continuing production.**
- Hence the firm will decide to shut down in the short-run.

<u>Scenario 2:</u> Subnormal profit – if AR > AVC – do not need to shut down

2. The firm should not shut down if it is making subnormal profit but its TR ≥ TVC or AR ≥ AVC

- Suppose the firm's demand falls by a larger extent such that its AR falls below its AC, so the firm is now making subnormal profit. In this case, it will have to take its variable cost into consideration in its decision to shut down and see whether its total revenue can cover its total variable cost or AR can cover AVC.
- This is because the firm will still incur its fixed costs even if it decides to shut down in the short-run. If the firm were to shut down, it will still have to pay for its fixed costs, and its loss will be equivalent to its total fixed costs.
- Referring to Figure 1, suppose AR1 and MR1 are the firm's AR and MR curves after the fall in demand.

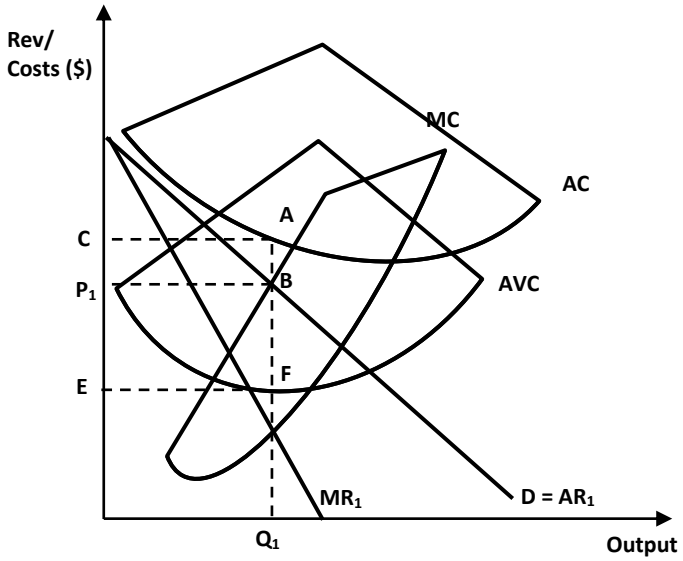


Fig 1 – AR > AVC

- At the new profit-maximising output of Q_1 where MR_1=MC, the firm charges a price of P_1 which is now lower than AC. As the firm **is making subnormal profit**, its decision whether to shut down in the short-run will depend on whether its revenue is able to cover at least its variable costs.
- In this case, **P_1 is still higher than AVC.**
    - Even though the firm is making subnormal profit, the **firm will not shut down as AR<u>≥</u>AVC**
    - This is because in the short-run, **fixed costs must be paid even if the firm were to shut down eg. the firm is committed to paying rent**. Therefore, if the firm stops production, it will make a **loss equivalent to its total fixed costs (ECAF).**
    - **However if it continues production**, even though it starts to incur the variable costs, the revenue earned can **pay for the variable costs as well as cover part of its fixed costs.** This means that the **loss incurred by continuing production in this case P_1CAB is smaller than the loss incurred by shutting down**. Hence the firm should **decide not to shut down.**

KR2: Expand its output - consideration of revenue and costs

- A firm whose objective is to maximise profit will decide on its price and output based on the marginalist principle of equating Marginal Revenue (MR) to Marginal Cost (MC) i.e. MR=MC
- Assuming a firm in an imperfectly competitive market e.g. a monopoly, the demand curve (AR) facing the firm will be downward sloping as the firm has the ability to set its price. MR is the additional revenue earned from producing an additional unit of output. MC is the additional cost of producing an additional unit of output.

- **If MR>MC**, the pr**oduction of an additional unit of output will add more to its revenue than to its cost.** This means that the f**irm's profit will increase by producing an additional unit of output** since its revenue will increase more than its cost. Hence the firm will **continue to increase output as long as MR>MC.** This is shown as **Q0** in Figure 3.
- Hence, **the firm will maximise its profit at the output where MR=MC i.e. at Q1 in Figure 1. At the output Q1**, the maximum price the firm can charge is determined by the demand curve or AR curve. Hence, the firm will set its price at P1.
- The profit-maximising firm will therefore decide to **expand output and produce at output Q1** and set price at P1.
- The profit of the firm is given by the difference between its total revenue and total cost ie. TR-TC = (AR-AC)xQ. This is shown by the **area C_1P_1ab** in Figure 3. Since the profit is where MR=MC, it is the **maximum profit the firm can earn**.

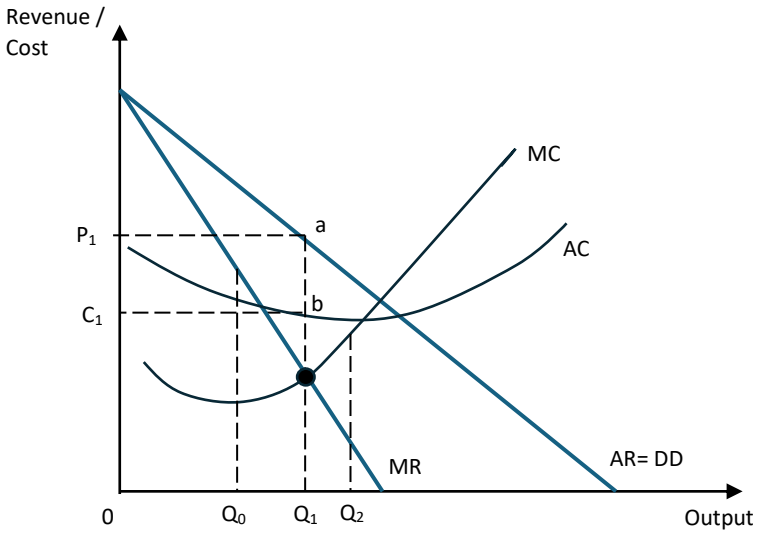


Figure 3 – Profit-maximising firm

Conclusion

- When faced with a fall in demand, a firm's decision to shut down is determined by whether its revenue is able to cover its variable costs. If it's TR > TVC, it will not shut down even if it is making subnormal profit. If its TR < TVC it will decide to shut down in order to minimise its loss.
- If there is a rising demand for the firm's goods and services, where AR and MR increases represented by a rightward shift in the AR and MR curves. A firm should expand its output if MR>MC as there is still additional profits to be earned by increasing output.

Part (b) suggested answer
Introduction

- Merger or price discrimination are strategies for an airline firm to increase its profits.
- Merger is able to increase revenue and lower costs, which will both help to increase profits.
- Price discrimination occurs when a firm sells the same product to different buyers (or different segments of a market) at two or more different prices for reasons not associated with differences in costs. 3rd degree PD will help to increase revenue to increase its profits (assume TC remains unchanged).

Body
Key Requirement 1: Merger that a firm can adopt to increase its revenue and lower its costs

1.a Revenue advantage:

- Air India announced its **merger** with smaller rival airline Vistara in 2022, there is one less airline firm in the market. Therefore, this means Air India now faces a **larger share of market demand** and the **demand rises**.
- As the **demand** for Air India is **more price-inelastic,** due to the **lack of substitutes** and **higher market power**. This allows the airline to raise the airfare with a less than proportionate fall in its quantity demanded, thus resulting in an increase in revenue.
- The increase in demand due to the merger leads to a **rightward shift in AR and MR** as shown in Fig 4, which results in an **increase in revenue.**
- As illustrated in Fig 4 below, the demand for Air India services increases from D_0 to D_1, with D_1 being **more price inelastic** for Air India than the original demand, D_0. Consequently, the MR curve shifts from MR_0 to MR_1.

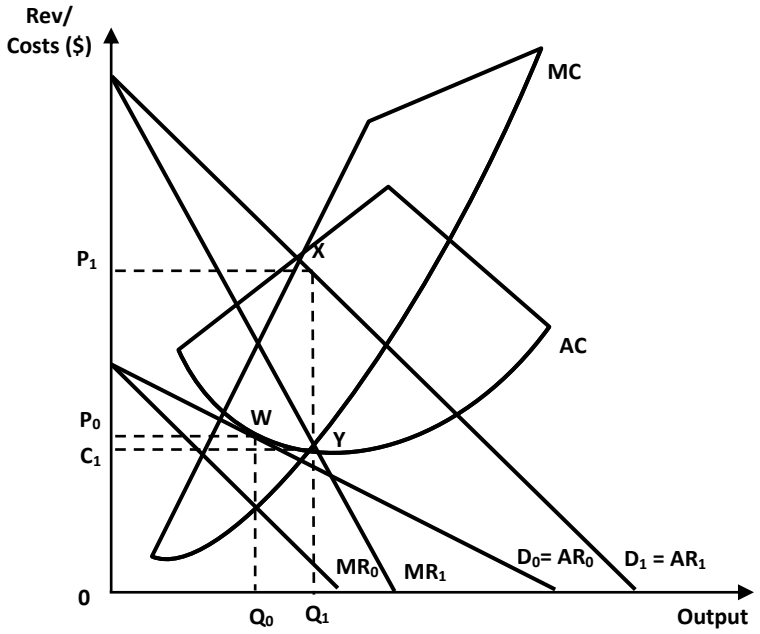


Figure 4 – Increase in demand due to advertising strategy

Assuming that the firm was initially earning normal profit at output Q0, the **increase in AR and MR** leads to an increase in its equilibrium output to Q1 and price to P1. This leads to **an increase in revenue from $0P_0WQ_0$ to OP_1XQ_1**. As a result, **the firm's profit increases from normal profit to supernormal profit of P_1XYC_1.**

Cost advantage – IEOS (explain one of the IEOS)

- One cost advantage of a merger for airlines is the ability to enjoy **technical economies of scale**, a type of internal economy of scale.
- After merging, the airline operates on a larger scale and can spread its **high fixed costs**—such as aircraft maintenance facilities, pilot training centres, and IT systems—over a greater number of flights and passengers.

- For instance, if Air India and Vistara merge and consolidate their aircraft maintenance into a single hub, they can reduce duplicate spending on equipment, staff, and infrastructure. This leads to a **lower average cost per plane serviced**, improving cost efficiency.
- By **lowering average costs** through technical economies, the merged airline can offer more competitive prices or enjoy higher profit margins, thus gaining a **cost advantage** in a highly competitive industry. Hence, profits for Air India would increase as its AC reduces, c.p.
- A key limitation of cost advantages from internal economies of scale (IEOS) in airline mergers is the risk of **diseconomies of scale**, particularly **managerial diseconomies**.
- As the merged airline becomes larger, it may face **challenges in coordination, communication, and management oversight.** With more routes, staff, and operations to manage, **the firm could face an increase in costs due to errors in complex coordination**, increasing average costs rather than reducing them.

Key Requirement 2: Explain Price Discrimination as a strategy to increase revenue

Explain how the three conditions for PD are satisfied:

- The airline operator/air carrier is a **price setter** (i.e. able to influence/control prices of air tickets) because it is an oligopolist with **high degree of market power** as a result of the **high barrier to entry.**
- The firm must have the ability to separate / segment the market into separate and identifiable groups at low or no cost, so that the firm can charge different price to different consumers or groups of consumers.
- Furthermore, there must be **no possibility of resale between the different markets**. Else, **consumers can buy goods in the cheaper market and resell it in the more expensive market**, thus restoring price equality, and **remove the firm's ability to price discriminate.**
- Firm is able to charge a higher price in the market where demand is more price inelastic and a lower price where the demand is more price elastic.
- For the same round-trip, **last-minute ticket buyers** (usually business travellers who may have to travel urgently / close to departure date) usually have a very **price inelastic demand** due to the **high degree of necessity** in terms of having to travel on a **specific date and time due to business commitments** such as to clinch business deals overseas or to attend a conference and meeting unlike **leisure travellers** are **flexible to travel on another date**, have different options in the date and time for travel and plan their traveling in advance. Hence, **leisure travellers have a lower degree of necessity to travel on a specific time and date.**
- Thus, last-minute ticket buyers (usually business travellers) face a relatively price inelastic demand and they are not very responsive to airfare increase, compared to those who purchase in advance. Airlines/ air carriers usually charge last-minute buyers more expensive air tickets due to the higher willingness to pay, and charge those who purchase in advance lower air tickets prices to 'try to get the most revenue out of each flight based on what people are willing to pay' due to differences in PED.
- Suppose the 2 groups of buyers are Market A (**last-minute ticket buyers)** and Market B (travellers who are **flexible to travel on another date)**.
- Market A (**last-minute ticket buyers)** has a price inelastic demand while Market B has a price elastic demand (travellers who are **flexible to travel on another date)**.
- Suppose the airlines initially charges the same price in both markets. With price discrimination, the airlines now charges a higher price in Market A (**last-minute ticket buyers)**, and a lower price in Market B (travellers who are **flexible to travel on another date)**.
- The higher price for **last-minute ticket buyers** (Market A) results an increase in revenue.
- In Market B (**flexible to travel on another date), t**he lower price results in an increase in revenue.
- As the revenue increases in both Markets A and B, the airline's total revenue is increased. Hence the third degree price discrimination results in an overall increase in the airline's revenue.

- While third-degree price discrimination can be profitable when distinct consumer groups can be identified, in practice, it may be **challenging to segment the market accurately based on PED**.

Conclusion

- **In conclusion**, both a merger and third-degree price discrimination can help an airline increase profits, but their effectiveness depends on context.
- **Overall**, third-degree price discrimination is often **more effective in the short run** for increasing profits, especially when market segmentation is clear and technology allows precise fare targeting.
- However, if the goal is **long-term cost efficiency and expansion**, a merger may offer greater strategic advantages.

3 The use of public transport is often regarded as sustainable travel as it helps reduce traffic congestion and air pollution. While the public transport in Singapore is reliable, improvements are needed to make it more appealing. Singapore has implemented real-time digital displays to help reduce uncertainty and perceived waiting times when taking public transport.

(a) Explain **two** different reasons for the market failure associated with the use of public transport in Singapore. [10]

(b) Assess the effectiveness of the policies available to the Singapore government in overcoming market failure in Singapore's public transport market. [15]

Part (a) suggested answer
Introduction

- Public transportation (such as MRT) can be considered merit good which is socially desirable but under-consumed by the public (commuters).
- Merit goods are goods and services that usually generate **positive externalities when consumed** and thus the government deemed it as socially desirable but feel that individuals will under consume without any form of government intervention, possibly because of **information failure**, where individuals lack information of the full benefits of consumption.

Body
KR1: Presence of positive externality in consumption

- There is presence of positive externalities in the usage of public transport in Singapore.
- The usage of public transport by the consumers has **reduced the congestion and pollution** on the roads from usage of cars.
- This means that there are **external benefits enjoyed by the 3rd parties** (users who drive on the roads will face less congestion and reduced health problems caused by pollution) from the usage of these public transport by the private individuals.
- The utility-maximising consumer will maximise their utility by using public transport up to the quantity **Qp** as illustrated in Figure 1.
- However, the **presence of external benefit** will mean that there is a **divergence** between the **MPB and MSB curve**.
- Assuming that there are no negative externalities in the usage of public transport such that MPC = MSC, the **socially optimal level of quantity** that the consumers should be consuming will be at **Qs**.
- Under free market conditions, there is **under-consumption** where **Qp<Qs**.
- This will result in **a deadweight loss**, as illustrated by the **area AE_0E_1** as shown in Figure 1. This means that **social welfare is not maximized** and there is **allocative inefficiency** under the free market.

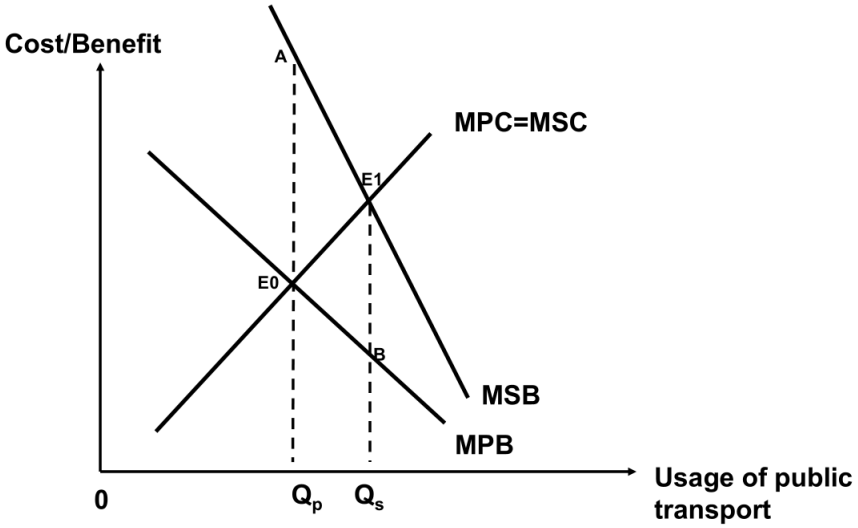


Fig 1: Positive externalities in the usage of public transport

KR2: Presence of imperfect information

- If left to the free market, it is likely that public transport will also be under-consumed because the individual undervalues the individual's private benefits from the usage of MRT/buses.
- Most individuals **underestimated the actual/true MPB** of public transport.
- People think the public transport is unreliable if passengers **don't know exactly when the bus or train will arrive**, they may overestimate waiting times, worry about delays and choose alternative transport (like cars or taxis) instead.
    - But **perceptions** can lag behind reality — if people *think* they'll wait too long, or feel uncertain about connections, they may avoid using it.
    - The **perceived waiting time** is often more influential than **actual waiting time** in consumer's decision to use the public transport.
- **Actual benefit** may still be high (system could be punctual), but information gap reduces *utility* derived from using it. The actual benefit of public transport:
    - Singapore's public transport is generally **reliable** (high frequency, low breakdown rates compared to many cities).
- Hence, the **perceived benefit** of public transport is **lower than the true benefit**. This leads to **underconsumption** of public transport — fewer people use it than would if they had better information. With reference to figure 3, due to imperfect information, there is a **divergence between MPBperceived and MPBactual.**
- When individuals undervalue the benefits of public transport, the individuals will use public transport at **0Qp', where MPBperceived = MPC.**
- However, if the individuals have perfect knowledge, they would have use public transport at, **0Qa, where MPBactual = MPC.**
- Hence, with imperfect information, there will be an **under-consumption of Qp'Qa** units of public transport and the **welfare loss is represented by area ABC.**
- To attain allocative efficiency in the case of imperfect information, the government could provide more information to inform individuals of the true benefits to the usage of public transport.

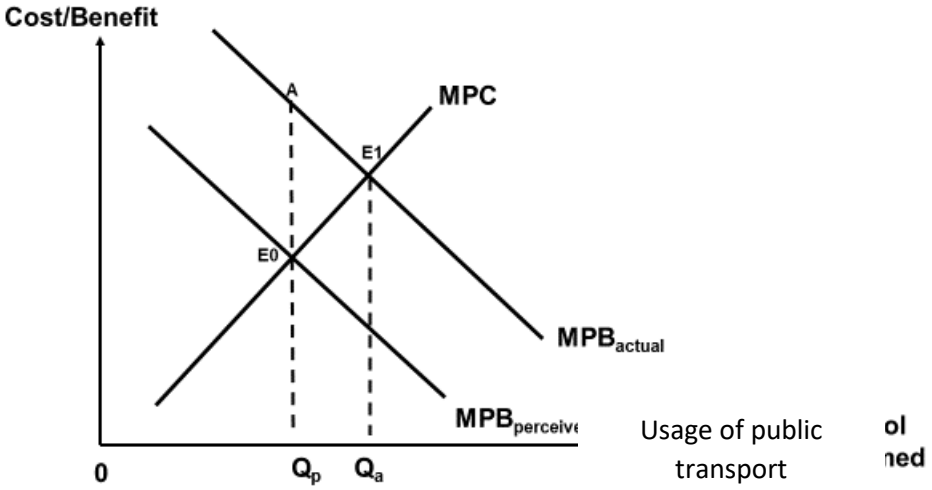


Figure 3: Imperfect information

Conclusion

- Public transportation (such as MRT) is socially desirable but under-consumed by the public (commuters). The two sources of market failure are **positive externalities in consumption** and **information failure**, where individuals lack information of the full benefits of consumption.

Part (b) suggested answer
Introduction

- Market failure occurs when there is a misallocation of resources, leading to allocative inefficiency under free market.
- In the market for public transport, there seems to be evidence of positive externalities in consumption/usage of public transport.
- Both market-based policies and non-market based policies will be necessary to effectively correct the positive externalities in consumption/usage of public transport identified.

Body
KR1: Real-time digital displays (non-market based policy) to help reduce uncertainty and perceived waiting times, to address imperfect information.

- Singapore has implemented **real-time digital displays** to help **reduce uncertainty and perceived waiting times** when taking public transport.
- **Information provision reduces uncertainty.**
- **With information, the perceived benefit of taking public transport increases to actual benefit** from MPBperceived to MPBactual (Figure 3)
- Once the individuals have perfect knowledge, they would have use public transport at, **0Qa, where MPBactual = MPC.**
- **At the socially optimum level of consumption, there is no more deadweight loss.**

1. **Limited reach**
   - Displays may be installed only at major stations or high-demand bus stops, leaving **smaller stops without coverage.**

2. **Behavioural inertia**
   - Even with accurate information, not all commuters will change travel decisions to optimise routes — some may stick to **habitual patterns.**
   - This means perceived benefit may rise, but **actual benefit gains could be smaller** than expected.

3. **Opportunity cost:**
   - Installing and maintaining digital displays (hardware, software, network connections) involves high fixed costs. Funds could have been invested in actual service improvements (e.g., more buses or shorter headways) which may yield larger actual benefits.

4. Saliency can't **compensate for real problems** like:
   - Infrequent or overcrowded buses/trains
   - Poor connectivity in some new neighbourhoods.
   - Unreliable service or safety concerns
   - If the above **inconveniences remain**, consumers **may ignore salient benefits**.

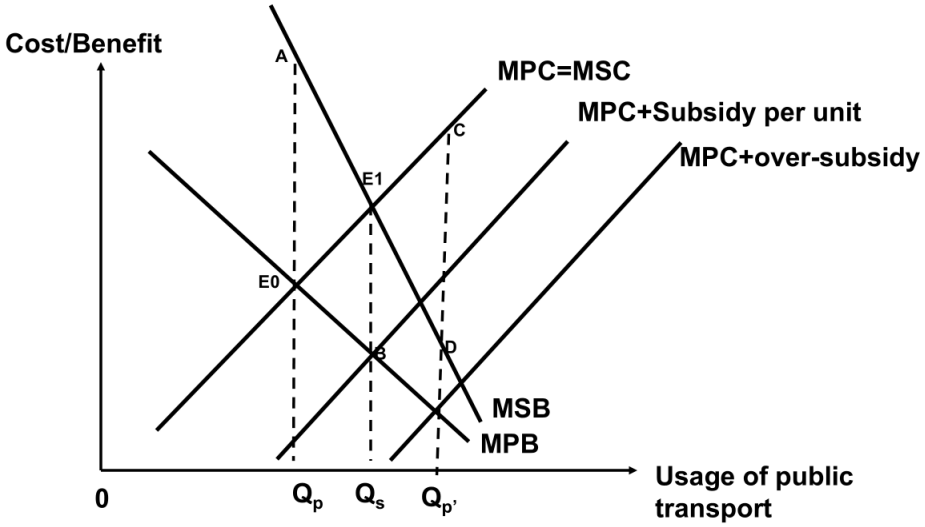
5. **Limited influence on high-income individuals**
   - Even with salient nudges, **some people resist change** due to routine, perception of status, or comfort with driving.
   - For wealthier commuters, cost savings or carbon impact may be less salient or motivating than comfort, privacy, or status associated with private cars.

KR2: Subsidies (market-based policy) for the use of public transport to address positive externalities in consumption

- To cover the cost of deferring further public transport fare hikes, the government will be pumping in an additional S$250 million (US$191 million) in **subsidies to support public transport operators (indirect subsidy)**. This **lowers the operating costs** for public transport providers, and this will translate to **lower prices for public transport.**

- Assuming a subsidy on the use of public transport which is equivalent to the **MEB of distance BE1** (Fig 2), the cost of additional consuming the use of public transport will be lowered.

- With reference to Fig 2, this will **reduce the MPC**, shifting the MPC curve from MPC to MPC + subsidy per unit, causing the consumers to consume the use of public transport up to the **level of Qs**, hence coinciding with the socially optimal output level, hence achieving allocative efficiency where there is **no more deadweight loss**.



1. **Accuracy in measuring MEB**
   - Due to imperfect information, it is **difficult** to **accurately measure the amount of MEB**.
   - During the review of benefit analysis, if the government re-calculates the amount of marginal external benefit to be more than expected, the government will need to increase the amount of subsidy as well. For instance, if the government places a higher monetary value of the benefit from use of public transport, thus, the amount of MEB will be revalued and adjusted upwards.
   - Likewise, if the government re-calculates the amount of marginal external benefit to be less than expected, the government will need to decrease the amount of subsidies accordingly.

2. **High Fiscal Cost and Overcrowding Risk**
- Peak-hour subsidies are expensive, especially since this is when demand is **already high**.
- Lower fares during non-peak hours could **worsen non-peak congestion** on buses and trains. Without corresponding **capacity expansion**, service quality may deteriorate.

3. **Limited Impact on Private Car Users**
- For wealthier individuals, a small fare subsidy may not outweigh the **convenience and status of driving**. Behavioural change in this group often requires **stronger disincentives**, like higher ERP charges or parking fees.

Conclusion
- While **real-time digital displays** help reduce uncertainty and perceived waiting times, hence reducing imperfect information can be **a low-cost and effective tool**, its impact is **limited if not paired with real improvements in service quality, infrastructure, and convenience**. It works best as part of a **broader strategy** that includes policy, urban planning, and service reliability.

- Subsidising public transport **can help reduce cost burdens**, but it may be **less effective at changing behaviour**.

- Today, the more pressing root cause of market failure is **imperfect information**: commuters not making optimal transport choices because of uncertainty and lack of transparency. Thus, the most effective policy moving forward is to enhance **real-time, accurate and widely accessible information displays** (e.g. crowd levels, alternative routes, predictive congestion updates). This directly tackles the largest remaining source of inefficiency, complements existing infrastructure, and does so at a much lower fiscal cost than continuous subsidies.

Paper 2 Section B – Essay Questions

4 Surging inflation at home and abroad since October 2021 has prompted Monetary Authority of Singapore (MAS) to allow the Singdollar to appreciate at a quicker pace within the policy band.

Source: The Straits Times, 24 July 2024

(a) Explain why the MAS policy designed to manage inflation in Singapore is different from other economies. [10]

(b) Discuss whether high rates of inflation make it harder for Singapore to achieve both inclusive and sustainable growth. [15]

Part (a) suggested answer
Introduction

- Inflation is a sustained increase in general price level in an economy.
- Singapore is a small, highly open economy that depends heavily on imported raw materials for production and on external trade to sustain economic growth. As a result, inflation in Singapore is often driven by imported cost-push factors. Therefore, using exchange rate policy is a more effective approach to managing such inflationary pressures.
- In contrast, larger and relatively less open economies such as the United States and China typically rely on interest rate adjustments rather than exchange rate policy to manage overheating in their economies.

Body
Key Requirement 1: Explain why an appreciation of SGD is used as a macroeconomic policy tool to control inflation in Singapore.

- Due to its lack of natural resources, Singapore needs to import most of the raw materials used for its production of goods and services, as well as its basic necessities such as meat and vegetables. Domestic demand in Singapore thus has a very high import content. It is estimated that out of every $1 spent in Singapore, 60 cents go to imports (ie. marginal propensity to import is high). Given its high dependence on imports, its domestic prices are very much dependent on foreign prices. Given its small size, Singapore is a price taker in world markets. Foreign price increases will lead to higher domestic prices (imported inflation), which can be offset by changes in the exchange rate. Hence, Singapore relies heavily on exchange rate policy to achieve the goal of low domestic inflation.
- Singapore's total volume of trade (exports + imports) is about 400% of GDP. The importance of imports in the Singapore economy means that exchange rate can have an important influence on the domestic costs of production, which would also impact export competitiveness. Moreover, the relatively high proportion of net exports in Singapore's GDP means that changes in exchange rate can have a significant impact on its GDP through influencing (X-M) and hence the level of aggregate demand.
- When the domestic currency (i.e. SGD) appreciates, imports become relatively cheaper in terms of local currency.
- As explained above, Singapore sources most of its raw materials and semi-finished goods from overseas due to its lack of natural resources, the cost of these imported inputs falls when the SGD strengthens.
- This leads to a reduction in production costs for firms operating in Singapore, thereby improving their profitability.
- As profit-maximising firms become more willing and able to produce, the short-run aggregate supply (SRAS) increases. This is represented by a rightward shift in the SRAS curve from $SRAS_0$ to $SRAS_1$ in Figure 1.
- Consequently, the increase in SRAS results in a lower general price level, as shown by a fall in the price level from P_0 to P_1 in Figure 1, thereby helping to alleviate cost-push inflation.

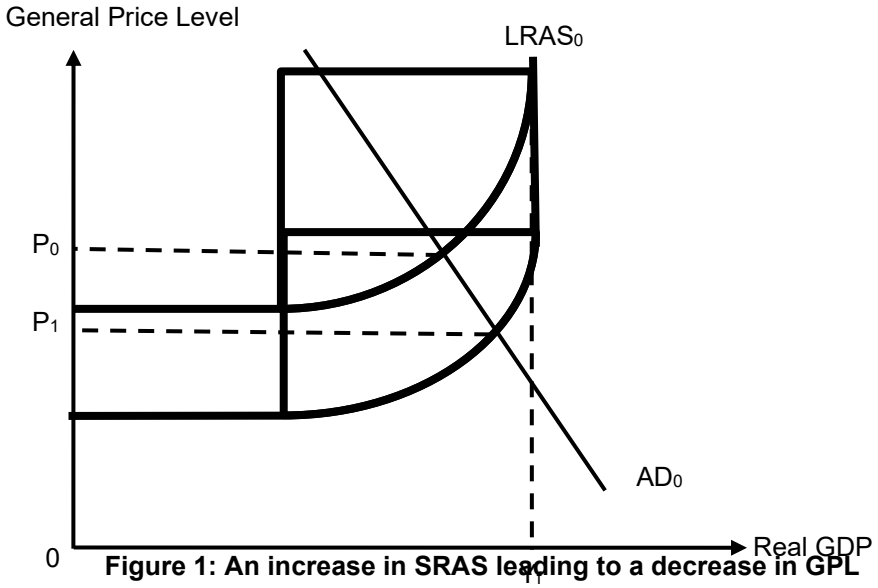


Figure 1: An increase in SRAS leading to a decrease in GPL

- Overall, the appreciation of the domestic currency would help specifically lower import price- push in Singapore.

Key Requirement 2: Explain why Singapore cannot control interest rate as a monetary policy tool

- Based on the Mundell-Fleming Policy Trilemma, every country can only have 2 out of 3 policy options – capital mobility, interest rate policy, and exchange rate control.
- As noted above, it is important for Singapore to manage its exchange rate to ensure price stability as a basis for sustainable economic growth.
- As an international financial and business hub, Singapore also priortises free capital mobility to attract foreign investment and multinational corporations. This helps Singapore's economy by boosting investment and creating jobs for people, reducing unemployment. Hence, Singapore must ensure that its capital markets are open.
- As such, due to the Policy Trilemma stated above, Singapore is unable to control interest rate as a monetary policy tool.
- If Singapore chooses to control its interest rates, then increasing it will result in an inflow of hot money into the economy due to higher returns. This short-term hot money inflow will thus increase Singapore's internal liquidity and increase its money supply, causing a fall in interest rate. The interest rate will fall until it is on par with the world interest rates, hence nullifying the initial increase in interest rate. Thus, Singapore is effectively an interest rate-taker, as its domestic money supply and interest rate will be affected by changes in the world interest rates.
- Moreover, if Singapore chooses interest rate management, it will have to give up control over exchange rates, and in a country reliant on international trade and capital flows, this would be detrimental to it. There will be repercussions if the exchange rate changes too extremely or fluctuates.

- Interest rates affect consumption and investment expenditure, making them a more suitable macroeconomic policy tool for large, less open economies.
- In such economies, like the US, the domestic market is large, and consumption (C) and investment (I) form a significant proportion of GDP. Changes in C and I therefore have a substantial impact on aggregate demand (AD) and the overall economy. A rise in interest rates can effectively curb inflation, as the resulting fall in C and I will significantly reduce AD, easing inflationary pressures.
- Moreover, as these countries are less dependent on trade they typically allow their exchange rate to float freely in the market.
- They also maintain free capital mobility to attract foreign investment and multinational corporations, which boost investment and create jobs.
- Therefore, with a freely floating exchange rate regime and open capital markets, these countries can use interest rates effectively as a monetary policy tool to control inflation.

Conclusion

- In conclusion, under the Policy Trilemma, a country that allows capital mobility must choose between controlling interest rates or exchange rates.
- Given the differences in the nature of the economy, the MAS uses exchange rate policy to manage imported cost-push inflation, while large, less open economies like the US rely on interest rate policy to influence domestic consumption and investment, thereby curbing demand-pull inflation.

Part (b) suggested answer
Introduction

- High rates of inflation refer to the increase in the general price levels that is more than the usual moderate rate of inflation. The MAS considers inflation slightly below 2% as consistent with price stability. Sustained inflation above 3% is interpreted as high for Singapore.
- High inflation can undermine inclusive growth by disproportionately affecting lower-income households, who face a greater loss in purchasing power and reduced access to basic goods and services. This widens income inequality and limits their ability to benefit from economic growth.
- At the same time, high inflation can hinder sustainable growth by creating uncertainty for businesses and consumers, discouraging long-term investment and efficient resource use. It may also lead to short-term decision-making that overlooks environmental sustainability, thereby compromising the well-being of future generations.

Body:
Key Requirement 1: Explain the effects of high rates of inflation on inclusive growth

- Inclusive growth is economic growth that creates opportunity for all segments of the population and distributes the benefits of increased prosperity, both in monetary and non-monetary terms, fairly across society.
- If domestic costs and prices of a country rise faster than costs and prices abroad, exports will be relatively more expensive than those of competitors abroad and imports will be relatively cheaper compared to the domestically produced goods.
- More expensive exports will cause foreigners to lower quantity demanded for the exports, causing export revenue to fall if the demand for the country's exports is price elastic. If demand is price elastic, the increase in price will lead to a more than proportionate fall in quantity demanded, ceteris paribus. Hence export revenue falls.
- The higher domestic prices will also result in an increase in demand for imported goods and services instead of domestically produced ones, thereby causing import expenditure to increase.
- Assuming the Balance of Trade is initially in equilibrium, the falling export revenue and rising import expenditure will result in a trade account deficit.
- A rising trade deficit means a fall in net exports (X-M) and hence a fall in AD as net exports is one of the components in AD. This leads to a more than proportionate fall in national income and output due to the reverse multiplier effect.
- This fall in national income also leads to reduced income tax and goods and services tax revenues for the government, thereby limiting its capacity to spend on programmes or transfer payments to attain inclusive growth. With fewer transfer payments, lower-income households will have less disposable income to spend on essential needs such as food, healthcare and education, thereby reducing their welfare more significantly compared to higher-income groups.
- High inflation leads to an erosion of purchasing power, reducing households' ability to afford goods and services. This decline in real income is especially severe for low-income and fixed-income households, whose nominal wages often do not rise in line with the general price level. As a result, their material standard of living deteriorates, with many forced to cut back on essential consumption.
- To cope with rising living costs, these households may need to work longer hours or take on multiple jobs, leading to increased stress, reduced leisure time, and a decline in overall well-being. The qualitative aspect of welfare—such as health, work-life balance, and access to basic needs—is compromised.
  On the other hand, higher-income households are better able to absorb the rising costs or protect their wealth through inflation-resistant assets. Thus, the impact of inflation is uneven across society, widening inequality. This undermines the goals of inclusive growth, as the benefits of economic progress are no longer shared equitably, and vulnerable groups are left further behind.
- High inflation in Singapore can increase income inequality by eroding the real income of lower-income households more than that of wealthier groups, which would be reflected in a rising Gini coefficient before government transfers. However, Singapore's extensive social support and redistributive policies work to reduce this impact, keeping the Gini coefficient after transfers comparatively lower and preventing a large increase in overall income inequality.

Key Requirement 2: Explain the effects of high rates of inflation on sustainable growth

- Sustainable economic growth requires that growth occurs without causing environmental harm or excessive depletion of natural resources, so that the well-being of future generations is not compromised.
- High inflation causes cost uncertainty and lowers business confidence, causing many firms to delay or cut back on investment – capital accumulation activities.
- This decline in investment spending, the act of acquiring new fixed capital assets (e.g. new plants, new machinery) and accumulating physical stocks and inventories (e.g. raw materials, semi-finished goods and finished goods held by the producer), leads to a reduction in aggregate demand (AD) from AD_0 to AD_1 in Figure 3 below. Through the reverse multiplier effect a larger or multiplied final change in national income. The economy returns to equilibrium

at a lower national income, resulting in a negative actual economic growth in the economy from Y_0 to Y_1 in Figure 3.

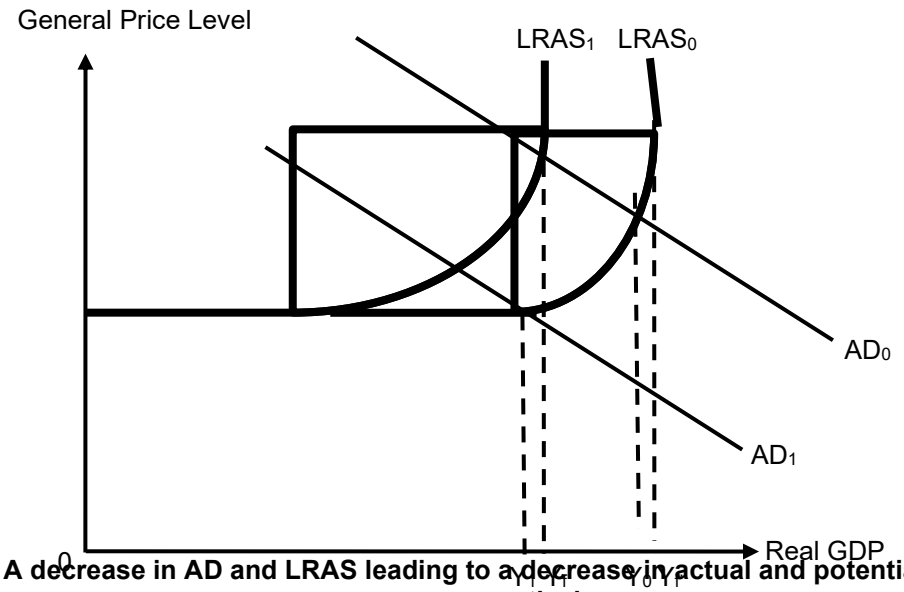


Figure 3: A decrease in AD and LRAS leading to a decrease in actual and potential economic growth respectively

- Moreover, reduced investment means fewer capital goods are accumulated. If the rate of capital depreciation exceeds the rate of new investment, the economy's productive capacity declines. This is represented by a leftward shift in the long-run aggregate supply (LRAS) curve, leading to a decrease in potential economic growth from Y_f to Y_f in Figure 3.
- A decrease in real national income leads to lower tax revenues for the government, reducing its financial capacity and willingness to provide green incentives or subsidies to firms. As a result, there may be less support for initiatives that help businesses adopt cleaner production processes and reduce environmental pollution.
- When prices are rising rapidly and unpredictably, firms face difficulty in planning long-term investments because future costs and returns become unclear. This uncertainty discourages businesses from committing resources to projects that require significant time and capital, such as adopting new technologies or improving production processes efficiently.
- Under inflationary pressure, firms may cut costs by neglecting environmentally friendly practices or delaying investments in green technology. This short-term focus risks depleting natural resources and increasing pollution, ultimately compromising the well-being and quality of life for future generations.
- Thus, high inflation not only disrupts economic stability but also hinders sustainable growth by undermining the careful, forward-looking decisions necessary to balance economic progress with environmental protection.
- While high inflation may dampen economic growth, the resulting fall in national income can have a positive side effect on sustainable growth, as reduced production lowers industrial emissions, resource extraction, and waste generation, thereby lessening environmental damage.
- An important consideration in evaluating the impact of high inflation on sustainable growth is the long-term nature of green investments. Both firms and governments typically plan and commit to green technologies well in advance, as research, development, and implementation require significant time and resources. Therefore, a short-term rise in inflation may not immediately or significantly reduce investment in this area.
- Even if new investments are temporarily scaled back, the effects of earlier investments—such as improved energy efficiency, cleaner technologies, or infrastructure upgrades—are likely still unfolding. As a result, the overall negative impact of high inflation on sustainable growth may be limited in the short term, particularly if prior efforts have already laid a strong foundation for continued environmental progress.

Conclusion:

Although Singapore may currently face a high inflation rate, if this rate remains relatively lower than that of her trading partners, positive economic growth can still be sustained, limiting disruptions to income distribution, investment, and environmental policies.

5 Frequent employment shocks in Singapore come as the world faces rising uncertainties, from geopolitical tensions to inflationary pressures. A key to improving the employment rate is to equip Singaporeans with the necessary skills to compete on a global scale.

Source: Channelnewsasia.com, 3 November 2022

(a) Explain **two** possible reasons for a rise in the unemployment rate in Singapore. [10]

(b) Discuss whether supply-side policies would be effective in bringing unemployment down in Singapore in view of the challenges faced by the economy. [15]

Part (a) suggested answer
Introduction

- Unemployment refers to the number of people of the legal working age who are willing and able to work but are unable to find suitable employment.
- The unemployment rate, usually represented by the symbol U, is unemployment expressed as a percentage of the total labour force:
- where Labour Force = Number Employed + Number Unemployed

$$\textbf{Unemployment Rate} = \frac{\textbf{Number Unemployed}}{\textbf{Labour Force}} \textbf{ X 100\%}$$

- Given the preamble about frequent employment shocks in Singapore, global uncertainties, and the need to equip workers with competitive skills, the relevant types of unemployment in Singapore would be cyclical, structural and frictional.

Body
Key Requirement 1: Explain the reason for a rise in cyclical unemployment in Singapore

- Cyclical unemployment refers to unemployment that is associated with the business cycle – alternating booms and slumps in economic activity. This type of unemployment is unpredictable and irregular.
- The main cause of cyclical, or demand-deficient, unemployment is a decline in effective demand, typically during an economic recession. In Singapore's case, its large external sector makes it especially vulnerable to global uncertainties. When worldwide demand slows, export revenues fall, leading to a reduction in Aggregate Demand (AD), where AD = C + I + G + (X – M).
- Given the uncertainties, households and firms may also expect future income to fall as they anticipate tighter financial conditions ahead. Household will cut back on current consumption to save more for the future. This reduces consumption (C), a key component of AD.
- Firms, expecting weaker demand for their goods and services, will scale back on capital spending. This reduces investment (I), another key component of AD.
- A reduction in AD can be represented by a leftward shift of the AD curve.
- Through the reverse multiplier effect results in a larger or multiplied final change in national income.
- The economy returns to equilibrium at a lower national income, resulting in a negative actual economic growth in the economy from Y_0 to Y_1 in Figure 1.

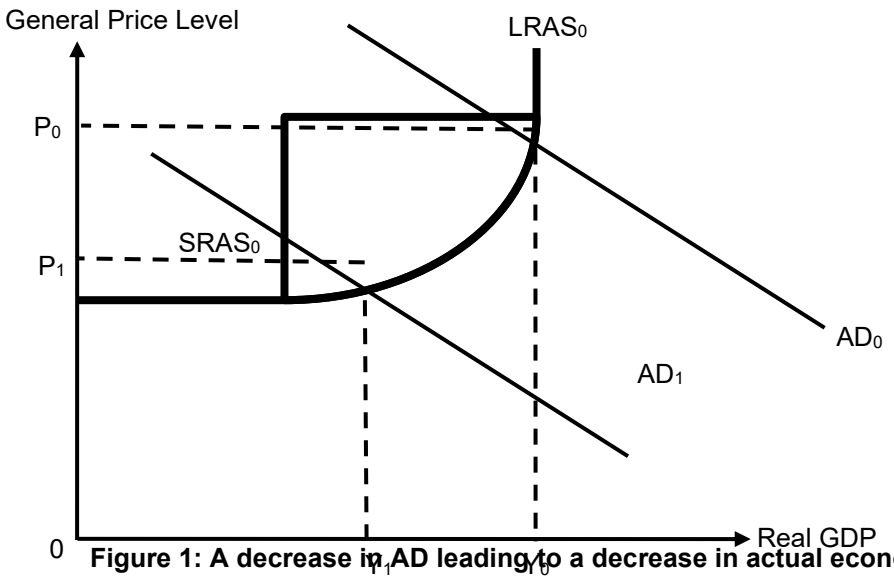


Figure 1: A decrease in AD leading to a decrease in actual economic growth

- This leads to reduced hiring and, ultimately, layoffs and lower cyclical employment levels.
- Singapore has experienced significant periods of high cyclical unemployment, particularly during the 2008–2009 Global Financial Crisis and the 2020 COVID-19 pandemic, both of which were driven by external shocks.

Key Requirement 2: Explain the reason for a rise in structural unemployment in Singapore

- Structural unemployment refers to unemployment that results from a mismatch of skills and job vacancies due to a change in the structure of the economy. It arises when the skills of the labour force do not match the available jobs. Even though the number of vacancies may be equal to the number of those unemployed, the unemployed workers may lack the skills needed for the jobs or may be in the wrong part of the country to take up these available jobs. There is thus a mismatch of skills and opportunities due to the structure of the economy changing.
- In Singapore, the adoption of labour-saving technologies such as automation and advanced production techniques has allowed businesses to maintain output with fewer workers, leading to a decline in labour demand and rising unemployment in certain sectors. For instance, the banking industry has seen job reductions due to the increasing use of automated teller machines (ATMs) and the growth of digital banking services like online and mobile banking. Technological changes affect Singapore's workforce by rendering some jobs and skills obsolete, and creating new roles such as fintech specialists and cybersecurity experts that many displaced workers may not be equipped to fill. This issue is compounded by occupational immobility, where workers find it difficult to switch to new types of jobs.
- Furthermore, as Singapore navigates the challenges of globalisation and outsourcing, it must continually restructure its economy to remain competitive. This ongoing transformation results in structural unemployment, as some industries contract while others such as research and development in advanced drugs expand, requiring workers to adapt to new demands in the labour market. For example, although Singapore has developed a strong biomedical sciences sector focused primarily on research and development (R&D), the mass production of drugs is often outsourced to lower-cost countries such as India and China. This shift limits job opportunities for low-wage manufacturing workers in Singapore, contributing to structural unemployment as the economy moves away from labor-intensive production towards high-value, knowledge-based activities.

Conclusion

- In summary, Singapore's unemployment rate may rise due to rising global uncertainties that reduce export demand and trigger cyclical unemployment, as well as structural shifts from technology and globalisation that displace workers whose skills no longer match industry needs.

Part (b) suggested answer

Introduction

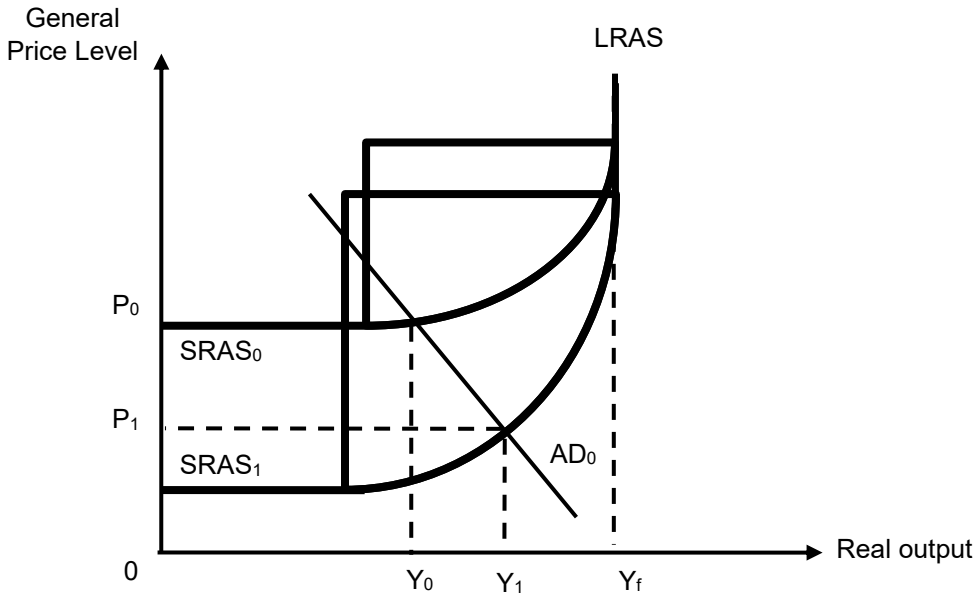
- Supply-side policies aim to shift the Aggregate Supply (AS) curve in the short run or long run, or both, through reducing structural rigidities and production costs and/or increasing productive capacity of the economy, and, hence influencing economic activity.
- As explained in part (a), the rise in unemployment in Singapore is largely driven by two key factors: cyclical unemployment and structural unemployment.
- As a small, open economy heavily reliant on external demand, Singapore is highly vulnerable to global shocks, including geopolitical tensions, inflationary pressures, and economic slowdowns in major trading partners.
- At the same time, rapid technological advancement, automation, and the shift towards high-value, knowledge-intensive industries create structural unemployment.

Body

Key Requirement 1: Discuss the use of supply-side policies in bringing cyclical unemployment down in Singapore in view of the challenges faced by the economy

- The Singapore government can lower firms' production costs by providing wage subsidies for their workers, thereby increasing short-run aggregate supply (SRAS).
- For example, during the COVID-19 period in 2020, employers received wage subsidies ranging from 25 to 75 percent for all local employees under the Jobs Support Scheme, which supported businesses in retaining jobs amid the downturn. A similar measure, the Jobs Credit Scheme, had been implemented in 2009.
- Such subsidies lower production costs, resulting in a downward shift of SRAS from $SRAS_0$ to $SRAS_1$, which raises the rate of actual economic growth from Y_0 to Y_1 as illustrated in Figure 2.
- As production increases, the demand for labour rises, thereby reducing cyclical unemployment.
- Therefore, the use of subsidies to reduce the cost of production for the firms increase economic growth and reduce cyclical unemployment.

Figure 2: Wage subsidy to producers



- Wage subsidies help lower firms' production costs, but their effectiveness depends on the cost structure of the firm, with labour-intensive firms benefiting more than capital-intensive ones. If labour costs form a large share of total costs, such subsidies significantly ease cost pressures and help firms retain workers. However, for capital-intensive firms where labour costs are relatively small, the reduction in overall costs is minimal. In such cases, wage subsidies may not sufficiently offset the fall in demand, and firms may still resort to retrenchments.

Key Requirement 2: Discuss the use of supply-side policies in bringing structural unemployment down in Singapore in view of the challenges faced by the economy

- The Singapore government can invest in reskilling and upskilling programmes to help workers transition into growth industries.
- Reskilling programmes, such as SGUnited Mid-Career Pathways and WSG Career Conversion Programmes, equip displaced workers with entirely new skillsets so they can move into expanding sectors. For instance, workers from

declining low-skilled manufacturing roles may be trained in robotics maintenance or healthcare support to enter industries with persistent labour shortages.

- Another example is the SkillsFuture Level-Up Programme, launched in 2024, which targets mid-career Singaporeans aged 40 and above who are especially vulnerable to structural unemployment from skills mismatches. The scheme offers a one-time, non-expiring $4,000 SkillsFuture Credit, which can be used for curated courses, including full qualifications and industry-relevant training. To encourage substantive reskilling, mid-career workers can pursue a second publicly funded full-time diploma at polytechnics, ITEs, or arts institutions. Furthermore, a mid-career training allowance will be given from 2025, covering up to 50% of a worker's average monthly income (capped at $3,000) for up to 24 months, making it financially feasible to take time off for full-time training. These measures reduce occupational immobility by equipping workers with in-demand skills, improving their ability to transition into new industries such as digital technology, green economy, or advanced manufacturing.
- In contrast, upskilling initiatives, such as SkillsFuture Credits and TechSkills Accelerator, enable workers to adopt new tools, processes, and technologies relevant to their current profession. For example, an engineer might learn to use AI-powered design software to remain competitive within the same engineering firm rather than risk redundancy.
- By aligning skills development with the needs of growth sectors such as fintech, biomedical sciences, and advanced manufacturing, these programmes enhance labour mobility and reduce occupational immobility, allowing workers displaced by automation or industry restructuring to transition into roles with strong demand, bringing structural unemployment down in Singapore.
- However, these reskilling and upskilling measures have limitations. Training programmes require time before workers can become proficient in new roles, meaning the benefits to employment and productivity are not immediate. Older workers may face steeper learning curves or greater difficulty adapting to new technologies, which could limit the effectiveness of such initiatives. Moreover, if economic restructuring occurs too rapidly, the pace of job losses in declining industries may outstrip the speed at which workers can be retrained, leading to transition unemployment in the short term.

Conclusion

- Supply-side policies such as reskilling and upskilling programmes can effectively reduce structural unemployment by addressing occupational immobility. These programmes equip workers with the skills needed to transition into roles with strong demand, not only within the local job market but also globally. This is especially important for Singapore, given its small size and heavy reliance on the external economy, which exposes its workforce to intense international competition.
- Supply-side policies such as providing wage subsidies and grants to support R&D projects have a limited effect in reducing cyclical unemployment, as the increase in Investment spending may not be able to offset the decrease in Net Exports. Therefore, other AD policies such as depreciation of Singapore dollars within the policy band should be used to increase the price competitiveness of Singapore exports.

6 United States (US) tariffs were placed on more than $300 billion in Chinese goods in 2018 based on China's alleged intellectual property theft and forced transfer technology. Across all affected sectors, the tariffs lowered Chinese imports by 13% during 2018 to 2021, raised US output by 0.4% and increased prices of US products by 0.2%.

Source: Bloomberg.com, 15 March 2023

(a) Explain how tariffs would impact consumers and producers in the United States. [10]

(b) Discuss whether protectionism is the best approach for governments to achieve their macroeconomic objectives. [15]

Suggested Answer Outline
Part (a)

Introduction:
- Tariff would have an impact on consumers in terms of the price of the good as well as the availability of the good, thus affecting consumers' surplus.
- For an economy such as United States which is still import-reliant on the global economy, domestic producers are affected by the possible higher costs of imported inputs. Yet, domestic producers may also see an increase in domestic production and thus revenue with the protectionist measure against more competitive imports with the implementation of tariff.

Body:
Key Requirement 1: Tariff has negative impact on Consumers due to higher prices, reduced consumer choice and variety
- Tariff is a form of protectionism that has the effect of raising prices of imported goods and reducing the quantity of imports available to consumers, lowering consumer welfare.
- Before tariffs, in figure 1, S_D and D_D are the domestic supply and demand respectively. P_D is the domestic market-clearing equilibrium price, while P_W represents the world price, i.e. the price at which imports are sold. Since consumers need only pay P_W for the imported good, domestic producers will also have to charge the same price in the domestic market. Hence, consumers only pay P_W for the good before tariff.

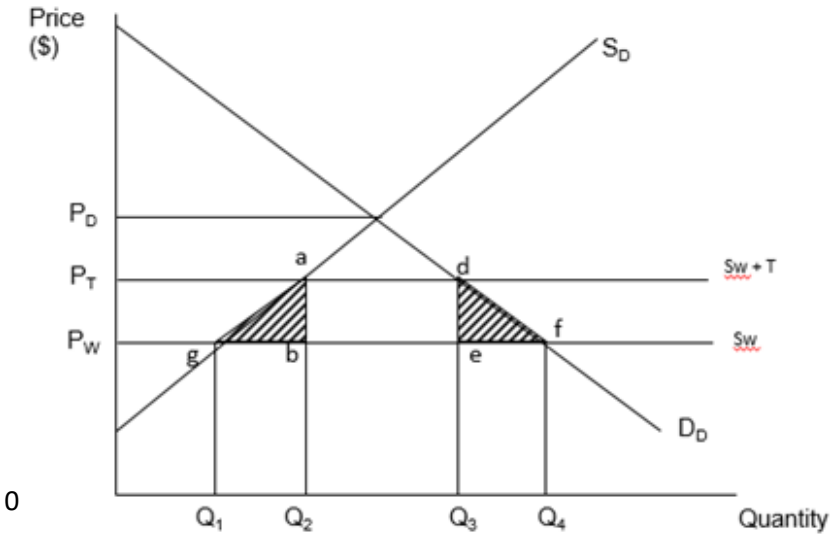


Figure 1: Tariff diagram showing the impact on economic agents

- Consumer surplus is the difference between of how much consumers in the market are prepared to pay and how much they actually pay. It is thus a measure of the impact on consumers' outcome. From figure 1, the imposition of a tariff increases the price of imported goods paid by domestic consumers from P_w to P_T resulting in a fall in consumer surplus represented by area P_TP_Wfd.
- At the price PT, domestic producers will supply Q_2, while quantity demanded is Q_3. The amount of imports is now reduced to Q2Q3, indicating a reduction in consumers' access and therefore choice to a wide variety of products from other countries than would otherwise be available without protectionism. Consumers may then have to contend with lower quality products and fewer varieties of goods.

Key Requirement 2: Tariff has positive impact on Producers in terms of Increase Revenue, Producers' Surplus and lowered unit costs with economies of scale but negative impact due to higher imported costs

- As seen in the diagram above, the increase in price of goods from PW to PT allows an increase in quantity supplied by domestic producers from Q1 to Q2. This thus leads to an increase in producers' surplus by area P_TagP_W.
- The lack of competitive pressure by foreign producers allows domestic producers to gain economies of scale. The lower unit cost of production thus allows the domestic producers to increase their profits, ceteris paribus.
- For an open economy, such as United States, which are reliant on the global economy for imported factor inputs, this may lead to negative impact on producers via an increase in imported cost of production. Ceteris paribus, this would lead to decreased profits for domestic producers.

Conclusion:

- Tariff has a negative impact on consumers, leading to a fall in consumers' surplus as well as their utility in terms of access to variety of goods & services.
- The impact of tariff on domestic producers depends on whether the impact on revenue of imported costs is more significant.

Suggested Answer Outline
Part (b)

Introduction:
- Economies such as United States are implementing protectionist measures, such as tariffs, in order to achieve their macroeconomic goals. This includes the consideration of achieve healthy balance of trade as part of external stability as well as the hope of achieve low unemployment by encouraging increased industrialisation within the domestic economy.
- However, there are other macroeconomic policies that governments may undertake to achieve these macroeconomic objectives.

Body:
Key Requirement 1: Protectionism is the best approach to achieving macroeconomic objectives
- Protectionism measures implemented, such as tariffs or non-tariff measures such as import quota, will lead to higher-priced imports. This results in a fall in import expenditure. Ceteris paribus, this would lead to a fall in debit items in the balance of trade account, leading to an improvement in balance of trade and thus achieving external stability.
- If import expenditure falls, then assuming no change to export revenue, net export revenue (i.e. X -M) will increase. As (X – M) is a component of aggregate demand (AD). The increase in AD would lead to a more than proportionate increase in national income via the multiplier effect. Actual economic growth is thus achieved.
- The increase in national income and output would lead to an increase in derived demand for labour as well, leading to a fall in cyclical unemployment. Protection from imports enables the domestic industries to expand and eventually reduces the country's dependence on imports while creating more jobs for its people. Moreover, foreign suppliers, in order to avoid paying the tax, may decide to set up production facilities in the tariff imposing country; hence employment in these countries will increase, further helping the economy achieve its aim of low unemployment.
- The exports of one nation must be the imports of another. To the extent that one country is able to stimulate its economy through an excess of exports over imports, some other country's unemployment problem is worsened by the resulting excess of imports over exports. The imposition of import quotas for the purposes of achieving domestic full employment is termed 'beggar my neighbour' policies.

Key Requirement 2: Supply-side policy is the best approach to achieving macroeconomic objectives
- Given the constraints in the global supply chain due to protectionism that arose post COVID-19 pandemic as well as sanctions put in place in consideration of the Russian-Ukraine war, the lack of internal stability is mainly due to cost-push factors, namely that of imported cost of production.
- In order to address the lack of economic growth and high unemployment due to cost-push factors, the implementation of supply-side policies may be more appropriate. These may include policies to enhance the productivity of an economy's labour force through upskilling and reskilling policies or the improvement in productivity via incentive to encourage adoption of digital innovation.
- The improvement in human capital (e.g. via upskilling and reskilling of labour force via Skillsfuture subsidies in Singapore) as well as improvement in quality of capital resources in an economy due to digital innovation (e.g. adoption of off-the-shelf digital solutions via SMEs Go Digital programme in Singapore) would lead to an improvement in the economy's productive capacity. This would improve its long-run aggregate supply (LRAS) and thus lead to potential economic growth.
- In addition, by equipping low-skilled workers with necessary skills sets and thus narrowing the mismatch of skills between workers skills and skills demanded by employers and increasing workers ability to work in expanding high-skilled industries, the government is better able to reduce structural unemployment with supply-side policies.
- Additionally, with increase in AS, there will be a fall in general prices which would thus help the economy achieve price stability.
- The fall in general prices would lead to lower inflation relative to other economies and thus exports will become relatively cheaper. This thus helps boost the price-competitiveness of the country's exports. If demand for exports are price-elastic, the fall in price of exports relative to other trading economies would lead to a more than proportionate increase in quantity demanded of exports, leading to an increase in export revenue. Ceteris paribus, this would lead to an increase in credit items in the balance of trade account, leading to an improvement in balance of trade and thus achieving external stability.
- There is opportunity cost in implementing supply-side policies as monetary funds diverted towards subsidies, may mean less funds channeled towards building infrastructure due to emerging challenges arising from ageing population, environmental health concerns.

- Some workers may not be willing to forgo current income to go for training even if the government subsidies part of their training cost. It also takes time for workers to be trained before they can apply skills learnt during training.

Conclusion:

- For a small and open economy such as Singapore who is reliant on the global economy for trade and foreign investment as key drivers of growth, protectionism which may stifle global trade is thus not the best policy to achieve its macroeconomic objectives. Instead, Singapore tends to focus on supply-side policies, with a focus on policies directed at achieving greater productivity and increasing LRAS to remain competitive in the global economy.
- For a large economy such as the United States which are less reliant on the global economy for its economic growth, protectionism may be a measure that best helps achieve its macroeconomic goals, especially in the short term. This is especially if excessive import expenditure is identified as a root cause of its macroeconomic issues.