2025 H2 Economics Preliminary Examination
Paper 2 – Suggested Responses & Mark Scheme

Question 1

In many parts of the world, essential goods and services such as rice and electricity are scarce due to limited natural resources and increasing demand. In deciding how best to address the problem of scarcity, economists typically assume that consumers and producers act in self-interest.

(a) Explain how the pursuit of self-interest and price signals could help to address the question of how much essential goods and services to produce. [10]

(b) Discuss possible policy measures that a government can use to ensure a fairer distribution of essential goods and services. [15]

Part (a)

R1: Explain how the pursuit of self-interest could help to address the question of how much essential goods and services to produce [Use of marginalist principle]

R2: Explain how price signals could help to address the question of how much essential goods and services to produce.

Introduction

Economists often assume that individuals act out of self-interest, guided by the marginalist principle, which states that rational agents make decisions at the margin—consuming or producing an additional unit as long as the marginal benefit outweighs the marginal cost. In markets, this behaviour is coordinated through price signals, which convey information about scarcity and preferences. Together, self-interest and price signals help determine how much of essential goods and services (e.g., electricity, rice, public transport etc.) should be produced.

Body

R1: Explain how the pursuit of self-interest could help to address the question of how much essential goods and services to produce [Use of marginalist principle]

In a free market system, consumers' and producers' buying and selling decisions are driven by their self-interests. Consumers consume based on self-interest, seeking to maximise net total private benefits from consuming goods and services. Consumers signal their preferences for different goods/services to firms by the different prices that they are willing and able to pay for them. The demand curve, which maps the relationship of quantity demanded of a good to its price, shows the highest prices that consumers are willing and able to pay for an additional unit of a good. This is equal to the marginal private benefit (MPB) derived from the good. Consumers are willing to buy an additional unit of a good/service when the MPB derived from

consuming it (which is the additional satisfaction enjoyed) exceeds or is at least equal to the price of the good (marginal private cost (MPC) incurred by consumers). According to the marginalist principle, if MPB>MPC, **it is rational for consumers who are self-interested to consume more of the good since the addition to their total benefit exceeds the addition to total cost which means net total benefit is rising.** Hence, they consume up to the point where MPB = P (MPC) at Q_0. *From the diagram, the consumer will consume at Q_0 (where demand intersects supply) to maximise their net total private benefits.*

Firms seek to maximise total profits from producing goods and services. Producers signal their willingness to produce different goods/services by the different prices they are willing to accept. In a perfectly competitive market, the marginal revenue (MR) is the price of the good. Being profit-maximisers, firms are willing to produce and sell an additional unit of a good/service when the MR from selling it exceeds or is at least equal to the MPC of producing it. This is because in producing one more unit, the addition to their total revenue exceeds the addition to total cost which means profits will rise. Thus, the lowest prices that producers are willing and able to accept for an additional unit of a good must at least cover their MPC. In the diagram below, the supply curve which maps the relationship of quantity supplied of a good to its price reflects the MPC incurred by firms in producing the good. Hence, producers will increase production up to the point where MPC = P at Q0 (where demand intersects supply) to maximise profits **[Figure 1].**

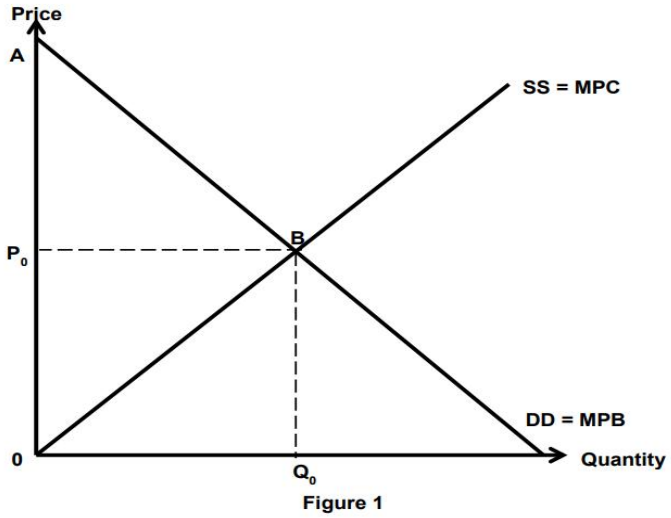


Figure 1: Market for an essential good/service (e.g Rice)

R2: Explain how price signals could help to address the question of how much essential goods and services to produce.

Consumers and firms make their consumption and production decisions independently of each other. Consumers decide what to buy, and by "voting with their dollars," they signal to producers what goods are in demand. This reflects **consumer sovereignty.** Firms decide what to produce based on which goods are most profitable. There is no one person or authority (such as the government) that is planning and directing the economy, yet the economy moves towards producing certain goods in certain quantities. In a free market, allocation of resources is achieved via the operation of the price mechanism which refers to the coordinating

mechanism by which the independent decisions of consumers and producers result in the allocation of scarce resources in a free market economy.
In a free market, price signals coordinate the independent decisions of consumers and producers, guiding them on how much to consume and produce respectively.

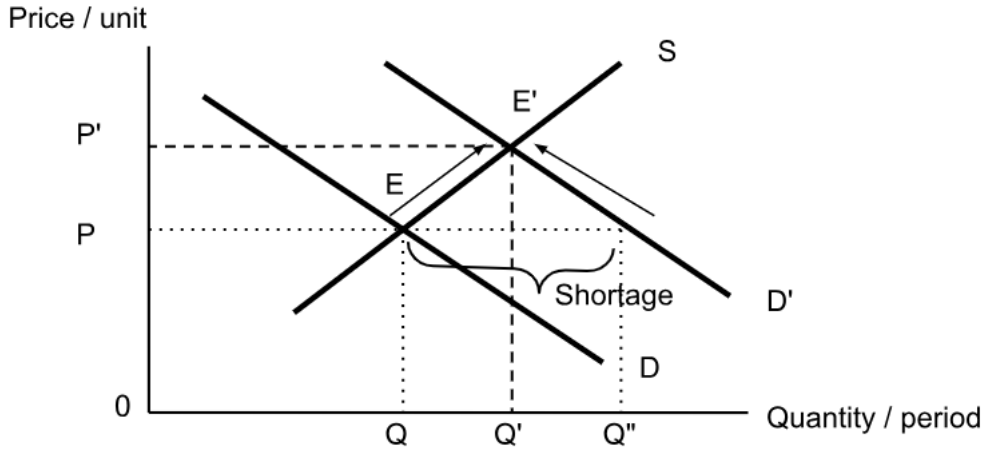


Figure 2: Increase in demand for essential goods

When there is an increase in demand for essential goods, **prices tend to rise, signalling** producers to increase output while encouraging consumers to moderate consumption. The initial increase in demand due to factors such as population growth or rising incomes will shift the demand curve to the right from D to D'. At the initial equilibrium price of P, the quantity supplied would be 0Q but the new quantity demanded would be 0Q", i.e., Qd>Qs, leading to a **shortage of QQ". This exerts an upward pressure on price**. **Faced with the shortage** at the original price P, consumers who are willing to pay higher prices in a bid to obtain the good will **cause the prices of these essential goods to rise**. The rise in price acts as a **signal to producers** that they will be able to earn more revenue to cover their marginal cost of production. **This rise in profitability incentivises profit-motivated firms to allocate more resources to expand production** and hence **quantity supplied rises**. At the same time, as **prices rise, the quantity demanded falls**. To increase quantity supplied, firms would need to enter factor input markets e.g., labour market and purchase more factor inputs. This channels resources toward producing more of the good. But the new, higher price is also a signal and incentive for consumers: it signals that the good is now more expensive, and is an incentive for them to buy fewer units.

As illustrated in Figure 2, the consequent movements along the (new) demand and (existing) supply curves lead to a new equilibrium at E' (shortage is eliminated) **where equilibrium quantity has increased.** At the new equilibrium, E', there is no tendency to change as consumers and producers consume and produce the amount they want to maximise their self-interest.

Thus, an increase in demand leads to an increase in equilibrium price from P to P' and an increase in equilibrium quantity from Q to Q' where prices act as a signal to decide on how much essential goods and services to produce.

Mark Scheme

Level	Descriptors	Marks
L3	**Analytical and diagrammatic explanation of** how the pursuit of self-interest and price signals could help to address the question of how much essential goods and services to produce. E.g. how firms and consumers use the marginalist principle to decide how much to produce and consume AND how price signals could help to address the question of how much essential goods and services to produce. There should also be good application to the context of essential goods and services.	**8-10**
L2	**Under-developed explanation of** how profit-maximising firms (or consumers) use the marginalist principle to decide how much to produce (or consume) AND how price signals could help to address the question of how much essential goods and services to produce. ***OR*** **Developed explanation of one of the following:** - how profit-maximising firms (or consumers) use the marginalist principle to decide how much to produce (or consume) -how price signals could help to address the question of how much essential goods and services to produce. Some/little reference to context on essential goods and services	**5 - 7**
L1	**Relevant knowledge** of how producers (or consumers) decide on how much to produce (or consume) or how price signals could help to address the question of how much to produce but explanation shows conceptual errors.	**1 - 4**

(b) Discuss possible policy measures that a government can use to ensure a fairer distribution of essential goods and services. [15]

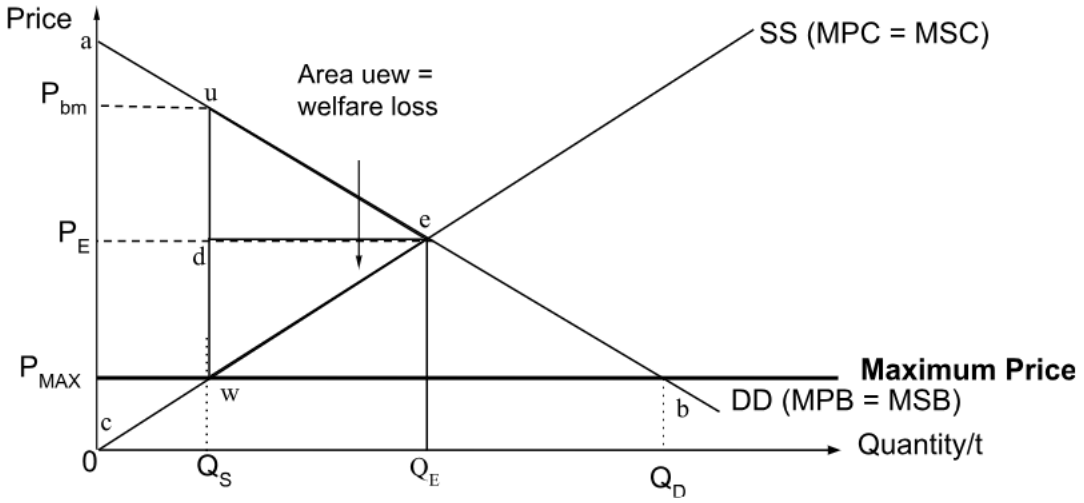
Introduction

The fair distribution of essential goods and services, such as food, healthcare, or housing, is a key concern for governments. Left entirely to market forces, access may be inequitable, as low-income groups could be priced out of necessities. To address this, governments often intervene through policies such as the use of price ceilings and production subsidies.

R1: A government can impose a maximum price on essential goods and services to ensure a fairer distribution (reduce inequity).
To ensure that basic essential goods and services (rice, electricity etc) are affordable and accessible to consumers, the government may impose a maximum price on certain goods and services

A maximum price is the maximum permissible price that producers may legally charge for a particular good or service.

Figure 3: Maximum Price



For the maximum price regulation to be effective, **the price must be set below the market equilibrium price.** A maximum price that is set above or at market equilibrium price would have no effect at all since the market equilibrium price is still attainable. Hence, price will fall from Pe to Pmax.

Maximum pricing is usually used to control the price of essential goods and services to make these goods more affordable for consumers (especially lower income households). For example, in the Philippines, the government imposes a price ceiling on rice to keep this staple food affordable for low-income households during periods of shortage. By capping the price below the market equilibrium, the policy aims to protect consumers' access to a necessity and prevent excessive price hikes during times of high demand or supply disruptions. Similarly, in India, maximum retail prices are set for a range of essential medicines such as insulin and

antibiotics, ensuring that life-saving treatments remain accessible to poorer households despite rising production costs or limited supply.
However, the price ceiling creates a persistent shortage. At the maximum price, there is a shortage of goods or services in the market. In Figure 3, the maximum price P_{MAX} leads to a shortage of (Q_SQ_D) units. Without a price ceiling, a shortage would lead to upward pressure on price, causing prices to rise until equilibrium is restored where price plays a rationing function – those who are willing and able to pay a higher price will get the good/service. However, with the price ceiling, as the price is now unable to clear the market, allocation may happen via queues, quotas, first-come-first-served, or administrative targeting. This can waste time, invite favoritism, and increase transaction costs.

In-body evaluation

For developing countries, with weak legislation and enforcements, black markets are likely to emerge. In the black markets, the shortages can spur resale at higher prices and ultimately undermine affordability to consumers who may need these essential goods more than others.

While a price ceiling can improve short-run affordability, it often worsens shortages and ignores the root causes of high prices (e.g low productivity, high input costs, or supply chain inefficiencies). Without complementary supply-side measures such as productivity improvements, it risks becoming a quick-fix and could potentially lead to longer term shortages which might worsen the inequity issues in these markets for essential goods. **Hence, a price ceiling is not an appropriate policy for the long run.**

R2: The government could implement production subsidies to ensure a fairer distribution of essential goods and services.

Subsidies are commonly given to producers of necessities such as food and essential services like healthcare services to improve equity in the distribution of goods and services.

While subsidies are typically meant to lower the prices of these essential goods and services, hence increasing the affordability of the output for consumers, in certain cases, the subsidies are also used to improve the livelihood of the producers, as in the case of farmers.
Example: The public healthcare institutions in Singapore are run as “private” companies, with management autonomy and flexibility to respond more promptly to the needs of the patients. They receive an *annual government subsidy for the provision* of subsidised medical services to the patients. Singapore has introduced ***means testing*** for public hospital patients since 2009. Depending on one’s ward choice and monthly household income, Singaporeans will enjoy a **tiered level of subsidies** ranging from 50% to 80%. This will allow the Government to stretch its resources and provide **more targeted assistance** to **help the lower- and middle-income** Singaporeans with their medical bills.

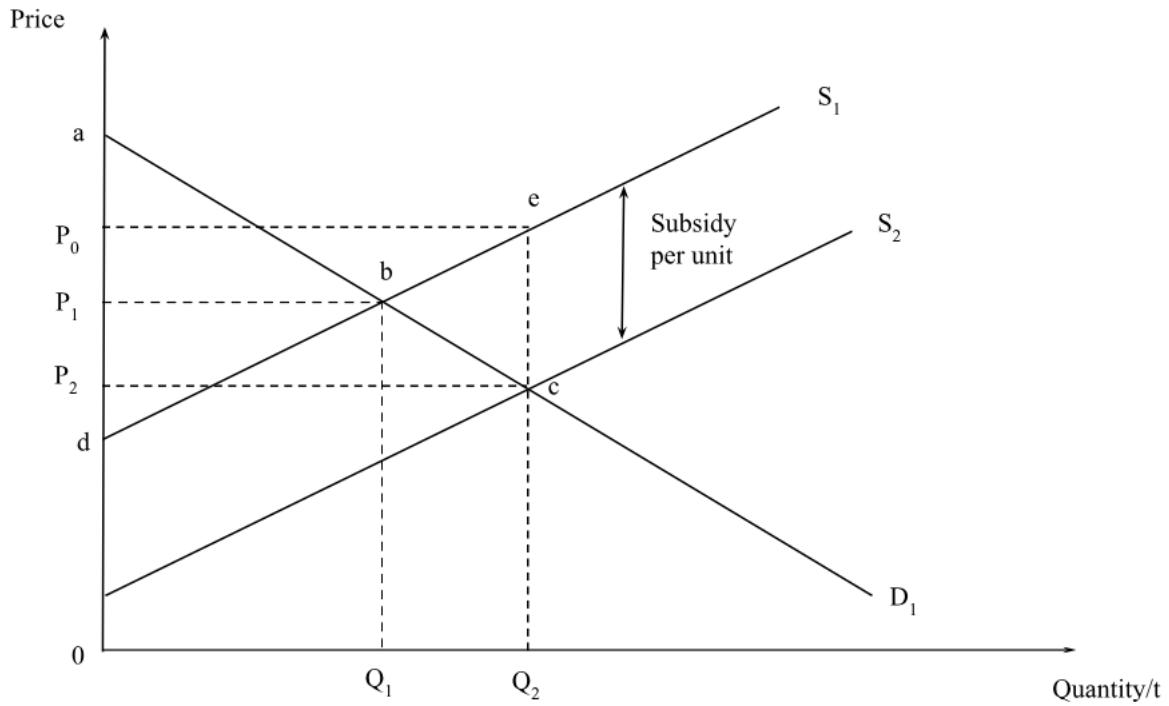


Figure 4

A production subsidy is a payment made by the government to producers to encourage the production of certain essential goods or services but not made in exchange for any goods or services. When a subsidy is provided for an essential good (for e.g., fuel, electricity), the marginal cost of production falls by the amount of the subsidy per unit. This increases the profitability of producing healthcare services, so firms will be more willing and able to produce at every price level. This causes an increase in supply, represented as a rightward shift of the supply curve from S_1 to S_2 (Figure 4). The rise in supply causes a surplus at original price P_1, putting a downward pressure on price. As price falls, quantity demanded rises as more consumers are willing and able to consume, while quantity supplied falls since profitability of production is falling. This continues until quantity demanded equates quantity supplied again. Overall, the subsidy causes the equilibrium price to fall to P_2 and the equilibrium output to rise to Q_2. Consequently, consumers pay a lower price at P_2 for each unit of the good which improves equity in distribution. On the other hand, producers receive a higher price at P_0 for each unit of the good.

In-body evaluation

1. Dependent on PED

The extent to which equilibrium price falls and equilibrium quantity increases depends on the price elasticity of demand. The more price elastic the demand for the good is, the price will fall less significantly but the quantity consumed will increase sizeably. Hence, since demand for essential goods and services like **rice, electricity, or public transport** tends to be relatively price inelastic (due to a lack of close substitutes), a subsidy may lead to a more significant fall in price rather than a large increase in consumption. This makes the goods more affordable and equitable, ensuring that lower-income households benefit more from the policy. A subsidy is thus an effective policy to improve equity in distribution of essential goods and services**.**

2. May not be suitable for countries with a persistent budget deficit

Total expenditure by govt. on subsidy = Subsidy per unit x units sold = (P_0-P_2) x $0Q_2$. Since this **incurs government expenditure, a subsidy may not be fiscally sustainable.** The use of subsidies **may not be sustainable** for countries where the government faces a **sustained budget deficit** or has a **tight fiscal budget**, such as Malaysia. Moreover, the government incurs an opportunity cost when it finances the subsidy as the scarce government resources could have been allocated for other uses such as building transport infrastructure. The net benefit from the next best use of the government's limited funds is thus sacrificed.

3. Impact may be more limited compared to direct transfer payments

While production subsidies can increase the supply of essential goods and lower market prices for consumers, their impact on equity may be limited and less direct compared to **direct transfer payments**. A direct transfer payment is any expenditure by the government for which it receives no goods or services in return, but instead directly boosts the income or purchasing power of households. Such measures, like welfare provisions or utilities rebates, are usually targeted at lower-income groups, ensuring that assistance is more effectively channelled to those in need. For example, in Singapore's Budget 2025, eligible households received a one-off **U-Save rebate** of up to $190 to help directly with rising utility bills. Unlike subsidies, which may benefit all consumers (including higher-income groups), transfer payments are more targeted and can better address inequity in access to essential goods and services.

Evaluative conclusion:

Production subsidies are **generally more appropriate than price ceilings** in ensuring a fairer distribution of essential goods and services, as they enhance supply in the relevant markets rather than merely impose a temporary price limit which may just be a short-term fix because of its resulting shortages.

While price ceilings can increase access to more affordable essential goods and services and benefit consumers in the short term, permanent shortages may occur if the price ceiling is imposed for an extended period, leading to inefficiencies and potential inequity as not all consumers can access the goods. For instance, rent control policies in cities like New York aim to keep housing costs within reach for low-income residents. However, the resulting shortages may lead to reduced quality and the emergence of black markets, undermining the intended benefits and hence should not be used as a permanent solution. As price ceilings involve markets for essential goods and services, black markets are extremely likely, since the richer households would be willing to pay more to obtain them.

On the other hand, subsidies encourage higher production, which increases supply and can sustainably lower prices, improving access to essential goods over the long term. Unlike price ceilings, subsidies do not lead to market disequilibrium (i.e shortage), so producers are still incentivised to respond to consumer demand, avoiding shortages. While the initial cost to the government may be higher, subsidies provide a more reliable mechanism to reduce inequity by expanding overall availability. However, such a measure is most feasible for countries with a strong fiscal position capable of funding these long-term interventions.

Mark Scheme

Level	Descriptors	Marks
L3	Well-explained analysis of any two policies (e.g. price ceiling, subsidies), that a government can use to ensure a fairer distribution of essential goods and services. For sufficient scope, the choice of 2 policies must be different in terms of rigour and analysis.	8 – 10
L2	Under-developed explanation of two policies (e.g. price ceiling, subsidies), that a government can use to ensure a fairer distribution of essential goods and services. Analysis that has some gaps in explanation (cursory explanation). OR developed explanation of only one policy.	5 – 7
L1	Some attempt to answer the question without economic application or answers that contain obvious flaws in theory.	1 – 4
E3	Evaluative judgements across both requirements are well-developed and backed by sound economic analysis. A summative conclusion that answers the question and takes a stand is provided.	5
E2	Some evaluative comments and attempts at making judgements that are explained using relevant economic analysis.	3 – 4
E1	An evaluative statement with some attempt at economic analysis.	1 – 2

Question 2

In Singapore, firms like GlaxoSmithKline and Roche hold significant market power in specialised drugs such as cancer treatments due to patent protection. This enables them to set high prices. Patients' lack of awareness of cheaper or equally effective alternatives can also result in overreliance on costly medications, resulting in inefficient resource allocation.

a) Explain how price setting ability and information failure in the pharmaceutical industry can lead to an inefficient allocation of resources. [10]

b) Discuss how government policies could be used to improve economic efficiency in the pharmaceutical industry and consider how likely it is that such interventions will be successful in achieving this aim. [15]

Part (a)
Requirement 1: Explain how price setting ability (i.e. market power) in the pharmaceutical industry can lead to an inefficient allocation of resources.

Requirement 2: Explain how information failure (i.e. asymmetric information) in the pharmaceutical industry can lead to an inefficient allocation of resources.

Introduction

Allocative efficiency is a condition that exists when firms produce the **combination of goods or services that is <u>most preferred</u> by consumers**. The combination of goods produced is in **the best public interest i.e., society's <u>welfare is maximised</u>** and it is impossible to change the allocation of resources in a way to make someone better off without making someone else worse off. **It is achieved when all firms produce at the socially optimal output where price = marginal cost of production or P = MC, assuming no externalities.**

In Singapore, firms like GlaxoSmithKline and Roche hold significant market power in specialised drugs such as cancer treatments due to patent protection. The presence of market power and asymmetric information in the pharmaceutical industry where producers have more knowledge of the efficacy, safety and side effects of the drugs can lead to an inefficient allocation of resources.

Body

Requirement 1: Explain how the price setting ability (i.e. market power) in the pharmaceutical industry can lead to an inefficient allocation of resources.

When a firm has price setting ability, i.e. market power, its output and price decisions in the pursuit of profit-maximisation can lead to allocative inefficiency.

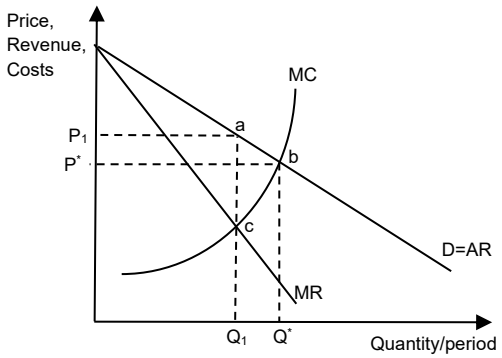
In a perfectly competitive market, where there is no public good and no externalities, the firm is a price taker. The firm faces a demand curve that is also the AR and MR curves. Its output and price decisions in the pursuit of profit maximisation leads to allocative efficiency. The profit maximising firm will produce where the marginal revenue, MR = marginal cost, MC. In this case, P = MR for the firm too. When there are no externalities, P reflects the marginal social benefit (MSB) and MC is the marginal social cost (MSC). As such, the price taking firm's profit maximising level of output where MR (=P) = MC will coincide with the socially optimal level of output where MSC = MSC.

However, due to **market power (i.e. ability to set prices),** an imperfectly competitive firm

faces a **downward sloping demand curve** where *MR is below the demand curve*. Firms in the pharmaceutical industry have market power as there are a few dominant firms (i.e., oligopoly structure). There are high barriers to entry (e.g. high start up costs, patents giving firms the exclusive rights to produce the drugs), giving the incumbent firms the ability to charge a high price.

An imperfectly competitive firm, in the pursuit of profit-maximisation, will produce **Q_1 where MR = MC**. It **exploits its market power by charging a price of P_1**. However, at Q1, **the price charged is higher than MC of production.**

Figure 1 Allocative Inefficiency in Imperfectly Competitive Market



Analysing the allocative inefficiency and deadweight loss

For the units Q1 to Q*, P>MC. This means that the price (P) consumers are willing to pay for the marginal unit **exceeds** the additional cost (MC) incurred by society in producing it. By producing at Q_1, there is presently an **underproduction** of this good from society's viewpoint. The firm has caused a **misallocation of resources** as fewer resources are allocated to the production of this good than is socially optimal (at Q^* where P=MC).

If units $Q^* - Q_1$ were produced, the additional benefit to society = area Q_1abQ^* whilst additional cost incurred by society = area Q_1cbQ^*. Since the additional benefit is greater than additional cost, there will be a **net** total benefit to society of area abc (area Q_1abQ^* - area Q_1cbQ^*) if these units were produced. By restricting output to Q_1, the firm has caused **welfare loss to society** as measured by the loss in the potential net benefit of area abc (known as **deadweight loss).**

Hence, a firm who has price setting ability can lead to allocative inefficiency.

[EXTRA: Monopolists, oligopolists and monopolistically competitive firms **all** face <u>downward sloping demand curves</u> and hence are **all allocatively inefficient** when they produce at the profit maximising output where MR=MC and charge a higher price than MC for every unit that is sold. **However,** the ***<u>extent</u>*** of allocative inefficiency is usually **more severe in the case of an oligopoly** than in the case of a monopolistic competition. This is because the demand for an oligopolistic firm's product (e.g. firms in the pharmaceutical industry) is generally much more price inelastic as there are only a few dominant firms in the industry. Hence the level of underproduction and deadweight loss generated is usually higher].

Requirement 2: Explain how information failure (i.e. asymmetric information) can lead to an inefficient allocation of resources.

Information failure in the pharmaceutical industry can lead to an inefficient allocation of resources.

Asymmetric information occurs where the pharmaceutical firms possess more knowledge of the efficacy of the medicine, and they will tend to promote those that reap the highest returns or encourage over-consumption. Patients' lack of awareness of cheaper or equally effective alternatives results in overreliance on these costly medications. This can lead to a problem of supplier-induced demand, as companies use extensive marketing to raise consumers' demand by causing their 'perceived' marginal private benefit (MPB) to be higher than their 'true' MPB. Assuming no externalities, true MPB = MSB, while MPC = MSC.

As consumers base their demand on perceived MPB, perceived MPB will be the demand curve, and the market equilibrium output will be at Q where the demand curve intersects the supply curve. However, the socially optimal output is at Q* where MSB = MSC. **Overconsumption** of (Q-Q*) units results, causing a deadweight welfare loss to society of area A as MSC>MSB for every unit between Q-Q*. ***For every unit between Q* to Q consumed, the addition to total social costs will be greater than the addition to total social benefits. Hence, information failure can lead to an inefficient allocation of resources.

***It is also correct to say that the TSB from consuming Q-Q* units is Area B (Fig. 2), while the TSC is Areas A+B. Hence, the overconsumption of Q-Q* units will lead to welfare loss of Area A.

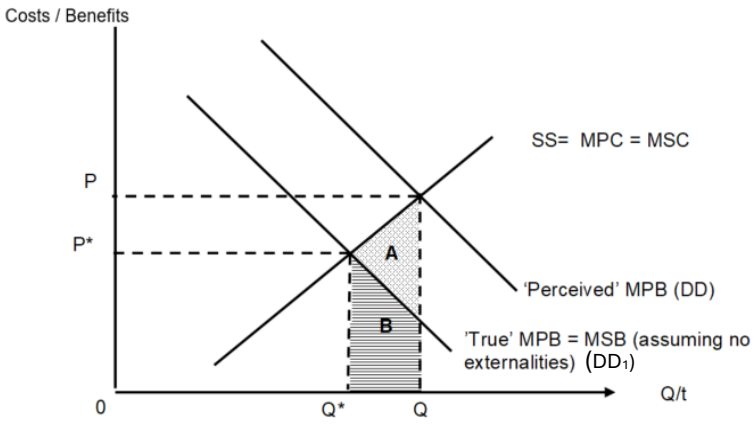


Figure 2 Market for Branded Drugs

Mark Scheme

Level	Descriptors	Marks
L3	Analytical explanation on how the ability to set prices (i.e. market power) and information failure (i.e. asymmetric information) in the pharmaceutical industry can lead to an inefficient allocation of resources. Use of relevant examples (contextualised to the pharmaceutical industry) with well-illustrated diagrams in explanation.	8-10
L2	Under-developed explanation on how the ability to set price (i.e. market power) and information failure (i.e. asymmetric information) in the pharmaceutical industry can lead to an inefficient allocation of resources. **OR** Well-developed explanation of how either the ability to set price or information failure in the pharmaceutical industry can lead to inefficient allocation of resources. Response may not be well-contextualised.	5 - 7
L1	Descriptive explanation with conceptual errors. Answers did not show understanding on how the ability to set price (i.e. market power) and information failure (i.e. asymmetric information) in the pharmaceutical industry can lead to an inefficient allocation of resources.	1 – 4

Part (b)
Discuss how government policies could be used to improve economic efficiency in the pharmaceutical industry and consider how likely it is that such interventions will be successful in achieving this aim. [15]

Introduction

Economic efficiency refers to a situation where resources are allocated in a way that maximises welfare to society, meaning it is impossible to make someone better off without making someone else worse off. Economic efficiency includes allocative efficiency (i.e. a combination of goods or services produced that is most preferred by society), productive efficiency (i.e. goods and services are produced at the lowest possible cost) and dynamic efficiency (i.e. firms are technologically progressive through investing in research and development).

In the pharmaceutical industry, the free market fails to achieve economic efficiency due to market power (firm's ability to set prices) and information failure. The government could adopt policies such as price regulation and reducing patent duration for the case of market power, and policies such as regulation (e.g. licensing and approval of medicine, mandatory disclosure) and public health campaigns for the case of information failure to achieve allocative efficiency but there may be trade-offs in terms of dynamic efficiency. All firms in the pharmaceutical industry, so long as they aim to maximise profits, would produce at the lowest possible cost of production and so are productive efficient. However, there may be X-inefficiency due to complacency for a firm that has significant market power.

Body

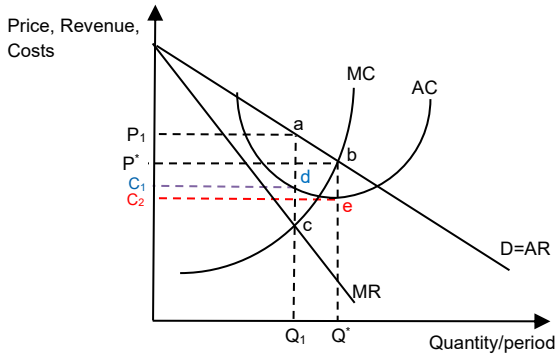
Requirement 1: Explain how a government policy (e.g. price regulation or patent restrictions in the case of market power) could be used to improve economic efficiency.

A government could implement a price regulation to improve economic efficiency

As explained in part (a), left to the free market, a profit-maximising firm will produce Q_1 units based on MC=MR and charge price P_1. This results in allocative inefficiency due to market power, with welfare loss to society of area abc as P > MC for Q^*-Q_1 units not produced. As such, social welfare is not maximised.

A government could implement a price regulation in the form of a maximum price, forcing the firm to lower its price. A maximum price or price ceiling is a legally permissible price set by the government on the highest price a seller is allowed to charge for a good or service. To be effective, a price ceiling must be set below the free-market equilibrium price. This could be done through MC pricing, where the firm is regulated to sell its medicine at a lower price P^*=MC. In doing so, the fall in price results in the quantity of the drug produced and consumed to increase to the allocatively efficient output of Q^*, hence maximising social welfare as the welfare loss of area abc to society has been removed.

Hence, a government could use a price regulation to improve allocative efficiency.



Whilst the government's use of MC pricing can theoretically maximise social welfare, the outcome is that pharmaceutical firms will earn less supernormal profits and in some cases, maybe subnormal profits. From the diagram, initially when output was at Q_1 where MR=MC, P>AC and firms were earning supernormal profits of area P_1adC_1. However, when the government regulates that the firms are to charge P=MC, at output Q*, the supernormal profits are reduced to area P^*beC_2.

The lower profits will reduce the firm's ability to invest in R&D for new drugs. Regulating a lower price would also reduce the potential profits that can be earned from new drugs, which lowers the incentive for firms to want to invest in expensive R&D as they may not be able to recoup their research costs.

Evaluation

Whilst the government can use price regulations such as MC pricing to achieve allocative efficiency, the resultant fall in supernormal profits may disincentivise and reduce the ability of the firms in the pharmaceutical industry to innovate to develop new medicine and/or process innovation to improve the production process. This may affect dynamic efficiency negatively.

As R&D to develop new drugs may have a long gestation period with no certainty of success, the government's aim to achieve allocative efficiency may come with the unintended consequence of dynamic inefficiency, as firms will be less likely to commit to investing heavily in R&D due to the lower profitability. Thus, the government may not be effective in achieving the aim of economic efficiency.

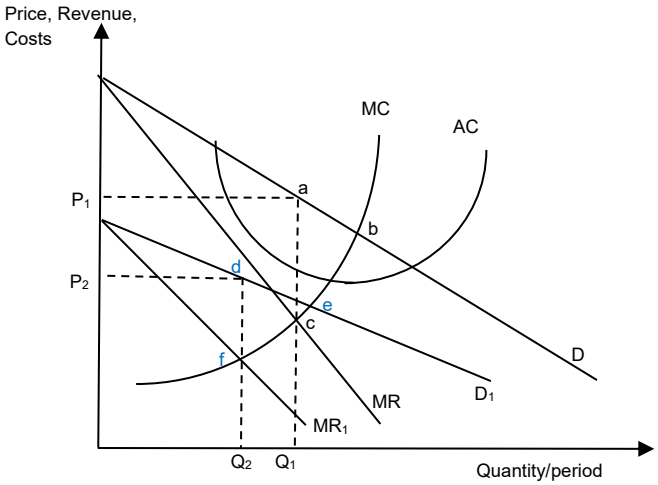
Note: Students can also discuss AC pricing (P=AC), which can improve allocative efficiency (welfare loss is reduced but not eliminated). However, as firms will only earn normal profits, the measure may result in no investment in R&D for pharmaceutical companies, which will worsen dynamic efficiency too.

Alternative Answer

A government can impose regulation to reduce patent lengths to increase competition in drugs markets

Currently, pharmaceutical companies in Singapore are awarded patents with a duration of 20 years, to cover the development and sales of the drug. The patent acts as a barrier to entry, where other firms are not allowed by law to produce this drug. During this time period, the company effectively is a monopoly as it is the only firm allowed to produce and sell the drug, giving it very large market power. This worsens the problems of allocative inefficiency as the firm would use its market power to reduce its output and raise the price to maximise profits. The large market power may also lead to X-inefficiency as the firm will be less conscious of controlling its costs.

Reducing the length of the patent period would allow competitors like generic drug companies to enter the market sooner, which has the effect of lowering barriers to entry and raising the level of competition in the market. This would lead to a fall in demand from D to D_1 (also MR to MR_1) and a more price-elastic demand for the patented firm's medicine, since there will now be a larger number of substitutes. With more competition and reduced market power, the output produced where MR_1 = MC will be greater (Q_2 instead of Q1), while the price charged will be lower (P_2 instead of P_1), which reduces allocative inefficiency from area abc to area def and improves social welfare.



Reducing the length of protection from patents may also induce firms to innovate further and develop new drugs in order to regain market share, thereby improving productive and dynamic efficiency.

Evaluation

However, this measure may not be effective as reducing the length of the patent duration may lead to an even higher price in the interim as the firms seek to recoup their R&D and marketing costs incurred before the entry of the generics. This will worsen allocative inefficiency. Reducing the length of the patent may also result in disincentive to invest in R&D, as it reduces the amount of potential profits that may be earned from new drugs, hence reducing dynamic efficiency.

Requirement 2: Explain how another government policy (e.g. regulation to disclose efficacy of medicines in the case of information failure) could be used to improve economic efficiency.

A government can impose regulation to disclose efficacy of medicines to improve economic efficiency.

Asymmetric information in the pharmaceutical industry happens when one party, usually the pharmaceutical company, knows far more about a drug's safety, efficacy, and side effects than patients or even doctors do. This can lead to problems such as overpricing, overprescription, unsafe products, or underuse of beneficial drugs.

Resolving it generally involves increasing transparency, standardising information, and aligning incentives so both buyers and sellers have similar knowledge. To address market failure caused by asymmetric information in the pharmaceutical industry, the government can implement policies like regulation through licensing and approval by the Health Sciences Authority (HSA). HSA can require pharmaceutical companies to conduct rigorous testing and clinical trials before drugs can be approved for sale. This ensures safety, where drugs do not cause harmful side effects, efficacy of drugs for their intended purposes and transparency where there is accurate information provided in labeling and advertising.

Government regulations to force producers to disclose and verify information will ensure better-informed decisions and restore market efficiency. With better information, the demand for costly medications will fall to DD_1 (see part (a) Fig 2) as perceived MPB shifts to the true MPB, resulting in the new market equilibrium quantity where new DD_1 = SS being the same as the socially optimal output, Q*. Hence, regulation could be used to improve allocative efficiency.

Evaluation
However, not all the consumers, especially the elderly and the less educated may be fully aware of the safety, efficacy and side effects of the drugs, since the information is complex, rendering the policy not so effective in achieving economic efficiency.

Alternative Policy

A government could also use public health campaigns to improve economic efficiency.

The government can also use public health campaigns to teach patients how to understand drug labels, seek second opinions, and verify information. HSA can also use online portals (e.g., HSA's drug safety updates) to provide accessible summaries for non-specialists. With access to more information, consumers will be better informed about the efficacy of the drugs, safety and side effects and reduce the demand for costly medications as the perceived MPB falls to the true MPB. This fall in DD results in the new market equilibrium quantity where new DD_1=SS (see part (a) Fig 2) becoming the same as the socially optimal output, Q* and achieving allocative efficiency.

Evaluation
As the information on pharmaceutical products can be quite technical, and consumers generally rely on the doctors to provide professional advice, the issue of supplier-induced demand can

still be not completely addressed, resulting in society's welfare not being maximised. A policy of public health campaigns may thus be limited in its success.

Conclusion

Government policies like price regulation / reduction of patent duration to address market power and regulation / public health campaigns to address information failure is unlikely to be successful in achieving economic efficiency in the pharmaceutical industry.

This is because in the case of pharmaceutical drugs, continued R&D (i.e. dynamic efficiency) is of great importance to society, as it ensures that good drugs, especially those life-saving drugs are developed to address evolving diseases. However, R&D for new drugs is extremely costly, and private firms need to earn a high enough level of profits to retain the incentive and ability to undertake more research in future. R&D also takes time, is of high risks and has uncertain outcomes.

Hence, implementation of price regulations such as MC pricing and shortening patent periods may backfire, as they erode the profits for pharmaceutical companies which may result in less R&D going forward and hence less dynamic efficiency. Furthermore, with imperfect information, it is difficult for governments to determine a 'fair' price on which to base regulation, that balances societal outcomes with ensuring sufficient profits for the firm.

Therefore, governments may see greater success in achieving dynamic efficiency by intervening through providing grants to encourage R&D to develop new drugs, as this method lowers the MC of investing in R&D and incentivise the private firms to innovate.

For the case of supplier-induced demand, possible government intervention of regulations on misleading advertising and publishing independent reviews of drug efficacy will likely succeed in helping to reduce demand and improve allocative efficiency, since more information is now provided to the consumers.

Mark Scheme

Level	Descriptors	Marks
L3	Analytical explanation on how government policies in the pharmaceutical industry could be used to improve economic efficiency in the case of firms having price setting ability **and** information failure. At least 2 types of efficiency from allocative efficiency (most important), productive efficiency and dynamic efficiency should be addressed for sufficient scope to score full credit.	**8-10**
L2	Under-developed explanation on how government policies in the pharmaceutical industry could be used to improve economic efficiency. **OR** Well-developed explanation on how one government policy in the pharmaceutical industry could be used to improve economic efficiency.	**5 - 7**
L1	Descriptive explanation with conceptual errors. Answers did not show understanding on how government policies in the pharmaceutical industry could be used to improve economic efficiency.	**1 – 4**
E3	For a well substantiated evaluation that synthesises economic arguments to arrive at well-reasoned judgments. The evaluation needs to be contextualised to the case of pharmaceutical industry.	**5**
E2	For an answer that makes some attempt at evaluation or a conclusion that answers the question. However, explanation of judgement is incomplete and/or not well-contextualised.	**3-4**
E1	For an answer that gives superficial evaluative statement(s) without sufficient elaboration.	**1-2**

Question 3

Digital innovation has transformed traditional markets, changing how firms operate. Even as economies recover from the COVID-19 pandemic, technological disruption has equipped firms with more insights into consumer preferences. With advanced analytics capabilities, firms can better segment their markets based on consumer behaviour data.

(a) In light of the advancement in analytics capabilities and post COVID-19 recovery, explain how the concepts of price and income elasticity of demand can help a firm to increase its revenue. [10]

(b) Discuss whether product differentiation or cost strategies are more appropriate for firms seeking to harness digital innovation to increase profits. [15]

Part (a)

Requirement 1
Explain how the concept of price elasticity of demand can help a firm to increase its revenue.

Requirement 2
Explain how the concept of income elasticity of demand can help a firm to increase its revenue.

Introduction

The total revenue (TR) of a firm is defined as the price of a good multiplied by the quantity sold. This essay will explain how a firm can use the concepts of price elasticity of demand and income elasticity of demand to increase its total revenue in response to technological disruption and post COVID-19 recovery.

Body

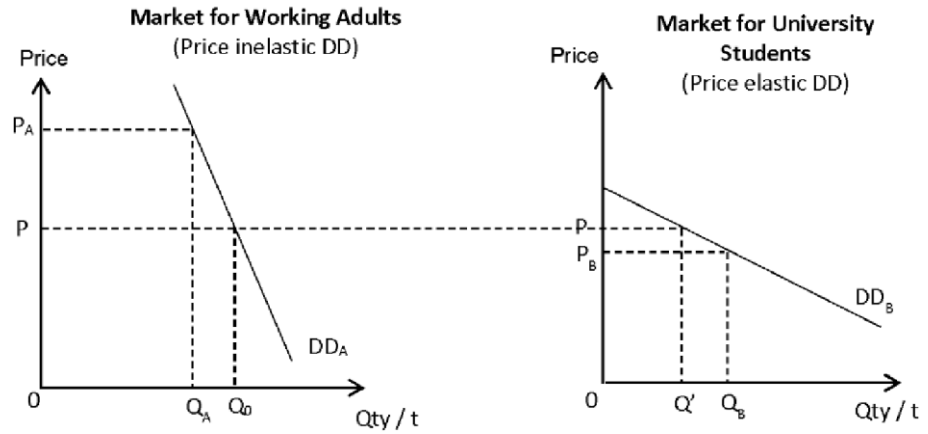
Requirement 1
Explain how the concept of price elasticity of demand (PED) can help a firm to increase its revenue.

Advanced analytics capabilities enable a firm to segment consumers according to PED.
Advanced analytics provides a firm with information on consumers' demographics, browsing behaviour, and location data. It analyses customers' willingness to pay by looking at their past spending habits, search history, or competitor price comparisons. Such information gives the firm an ability to predict demand through consumers' behaviour and measure their price sensitivity.
Firms can then segment consumers according to how responsive they are to changes in price, i.e. PED.

The concept of PED helps a firm to practise price discrimination to increase its revenue.
Price elasticity of demand (PED) measures the responsiveness of quantity demanded to a change in price, ceteris paribus. With the information given via advanced analytics capabilities, a firm with market power, i.e. the ability to set price, can segment consumers according to their PED and practise third degree price discrimination to earn higher revenues. Third degree price discrimination is defined as a price strategy where consumers segmented into distinct groups are being charged different prices for the same product for reasons not arising from cost differences. For successful price discrimination, firms must be able to differentiate and separate customers with differing PED. An example of this could be a firm, like Apple, where it can segment its consumers into 2 groups – working adults and university students. The demand from working

adults is price inelastic (i.e., **|PED| <1**) as buying, for example, a MacBook Air, takes up a smaller proportion of their income, and there may be few perceived substitutes for working adults who value the laptop's functions for professional use, portability, and connectivity with their other Apple products. On the other hand, the demand from university students is price elastic (i.e., **|PED| >1**) as buying a MacBook Air takes up a large proportion of their income, and there are many perceived substitutes as students are only looking for basic functions for schoolwork.

Using the diagrams below, if the firm charges all buyers the same price P, the total revenue earned would be {(P x Q) + (P x Q')}. However, with price discrimination, Apple would charge a higher price of P_A to adults. **The gain in TR from the increase in price is greater than the loss in TR from the less than proportionate fall in quantity demanded**, hence the TR earned from adults would increase to (P_A x Q_A). A lower price of P_B will be charged to university students. **The gain in TR from the more than proportionate increase in quantity demanded is greater than the loss in TR from the fall in price**, hence the TR earned from university students would increase to (P_B x Q_B).



However, there are certain conditions that need to be met for 3rd degree price discrimination to work effectively. Only firms with price-setting ability can price discriminate. The seller must also be able to identify and separate customers into *identifiable and separate* groups with each distinct sub-group having different price elasticities of demand, as explained above. There must be no possibility of resale or 'seepage' between markets. Price discrimination would not be possible if the goods sold in a particular market at lower prices (where demand is price elastic) could be easily resold to consumers in the market where the goods are sold at higher prices (where demand is price inelastic).
Hence the concept of PED can help a firm to practise price discrimination and increase its revenue when the above conditions are satisfied.

Requirement 2
Explain how the concept of income elasticity of demand (YED) can help a firm to increase its revenue.

The concept of YED can inform a firm on its output strategy so as to increase its revenue.
Income elasticity of demand (YED) measures the responsiveness of demand of a good to a change in income of consumers, ceteris paribus. With a change in income, demand for the good will change depending on whether the goods are normal or inferior goods. **Normal goods** have positive relationship between demand and income i.e. **income elasticity of demand (YED) value is positive**, which means when income increases, demand for such goods will rise. The degree of rise will depend on the magnitude of the income elasticity of demand. If the good is a luxury good, the rise in demand will be more than proportionate to the rise in income, ceteris paribus. In the case of necessities, the rise in demand will be less than proportionate to the rise

in income, ceteris paribus. In the case of **inferior good**, there is an inverse relationship between demand and income, and **YED value is negative**. When income rises, households will buy less of these goods. Thus, the concept of YED can help firms to decide on the type of goods to produce.

With post COVID-19 recovery, income of consumers rises and hence purchasing power rises. Consumers are now more able to purchase luxury goods at all price levels. Using the example of Apple, the firm would expect a more than proportionate rise in demand for its line of luxury products since the demand is income-elastic i.e. YED>1. This means Apple should increase production capacity for premium models like the iPhone Pro Max, high-end MacBook Pros, and Apple Watch Ultra which exemplify luxury goods and offer more of such products for sale. This is because as income increases, consumers who have already satisfied their basic needs will then allocate their additional income to higher-order wants, which have now become more attractive relative to necessities. Hence, with a significant rise in the firm's demand and hence its average and marginal revenue (AR and MR), price and output will be higher, resulting in significant rise in TR.

On the other hand, as their incomes improve, consumers may perceive Apple's older iPhone models or refurbished products as inferior goods as they exhibit inferior characteristics. As the YED is negative, demand for these goods fall. This is because with higher purchasing power, consumers substitute these inferior goods with superior alternatives that provide better perceived quality, convenience, or status. Thus Apple should scale back production of its older models and entry-level devices or discontinue the older models earlier than planned, creating artificial scarcity that might maintain some demand whilst clearing inventory, thus minimising the fall in TR.

Overall, the net TR rises as a firm uses the concept of YED to change its product mix to capitalise on the post-Covid 19 recovery.

Mark Scheme

Level	Descriptor	Marks
L3	• Thorough, accurate explanation and contextual application on the use of PED and YED to increase a firm's revenue. • Good use of examples to illustrate how PED and YED help to increase a firm's revenue.	8 - 10
L2	• Incomplete or inaccurate explanation of the use of PED and YED to increase a firm's revenue. • Answers are descriptive and lacking in economic analysis. • OR Well-developed explanation for the use of either PED or YED to increase a firm's revenue.	5 - 7
L1	• Listing of factors without economic explanation. • Multiple/ serious inaccuracies in answers.	1 - 4

Part (b)

Discuss whether product differentiation or cost strategies are more appropriate for firms seeking to harness digital innovation to increase profits. [15]

Requirement 1
Explain how product differentiation strategy through the use of digital innovation enables firms to increase profits.

Requirement 2
Explain how cost strategy through the use of digital innovation enables firms to increase profits.

Introduction

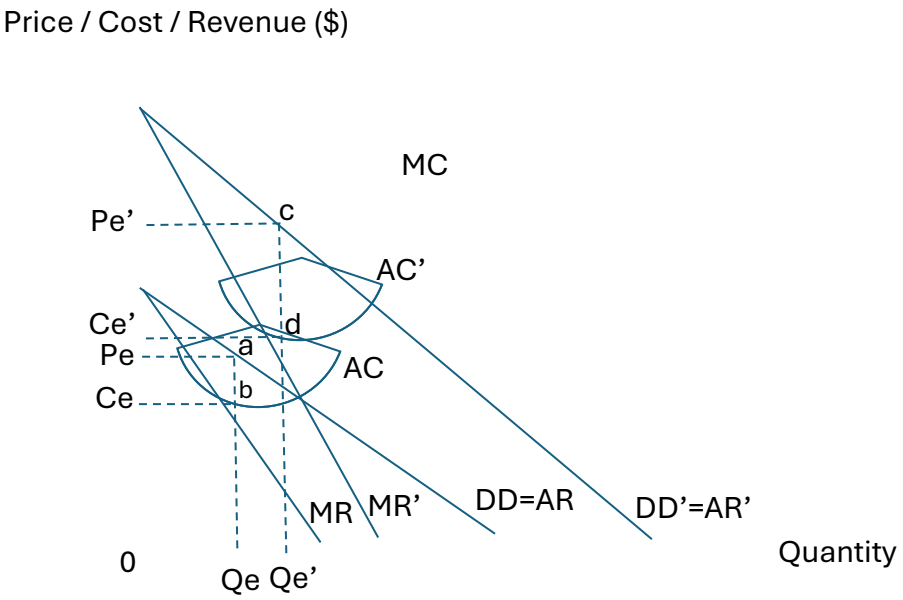
Profits of firms are defined as the difference between their total revenue (TR) and total cost (TC). Digital innovation has fundamentally transformed how firms operate and compete. As firms seek to harness these technological advances to increase profits, they face a choice between using product differentiation strategies or cost strategies. This essay will examine both approaches and evaluate which is more **appropriate** for firms seeking to increase profits.

Body

Requirement 1
Explain how product differentiation strategy through the use of digital innovation enables firms to increase profits.

Product differentiation strategy through the use of digital innovation enables firms to increase profits. The use of digital analytics allows firms to have better understanding of consumer preferences and hence enables firms to create unique, superior and targeted products. Firms can also provide digital services that complement their physical products. For example, in the food and beverage sector, Starbucks has differentiated itself through its mobile app, which allows consumers to order ahead, earn rewards, and receive personalised offers based on purchase history. The app creates convenience that traditional coffee shops cannot match. Consumers can order in advance and collect it without queuing. Such digital differentiation targets consumers who value convenience, like busy executives. Demand rises as the willingness to pay for the product increases. Similarly, Netflix uses sophisticated algorithms to create personalised content recommendations which differentiates it from traditional broadcasters and other streaming services that offer the same content to everyone. This customisation has enabled Netflix to expand its market despite intense competition. Thus the use of digital innovation results in real product differentiation between the firm's product and its rivals', thus reducing the degree of substitutability between their products. It also enables firms to increase their market share.

If a firm is successful in product differentiation, the demand for the firm will be higher and less price elastic (shown in the figure below as DD'=AR') as the product is better and more differentiated from its substitutes, making consumers more willing to buy it. The firm is then able to produce at a higher output of Qe' and charge a higher price of Pe'. Its total revenue and hence profits rise, assuming TR rises by a greater extent than TC. As seen in the figure, the firm is originally producing at output level Qe where MC=MR, and earns supernormal profits of (Pe-Ce) x Qe. Successful digital innovation leads to a rise in demand (rightward shift from DD=AR to DD'=AR'), and a corresponding rise in MR to MR'. The profit-maximising firm now produces at a higher output level Qe' where MC=MR' and charges a higher price Pe' to maximise profits. While the AC is now higher (AC rises from AC to AC') as it includes the R&D costs (which is a fixed cost), the rise in price could be higher, resulting in a rise in its supernormal profits to (Pe'-Ce') x Qe'. Supernormal profits have increased from area PeabCe to area Pe'cdCe'.



[EV] Product differentiation is appropriate as it enables, for example, Starbucks to charge premium pricing with strong customer loyalty. By harnessing digital innovation, a digital ecosystem creates significant convenience and personalisation such that customers would likely willingly pay a higher price compared to competitors. The app's reward system and personalised offers tap on loss aversion, as customers would lose their accumulated points and personalised preferences by moving to competitors. Digital innovation thus make demand less price elastic, allowing firms like Starbuck to maintain higher prices without losing customers proportionally. This results in a rise in its total revenue and assuming its total cost rises slower, profits will rise and thus it is appropriate as a strategy.

[EV] However, product differentiation strategies may not be appropriate as they face limitations. Digital innovation requires substantial upfront investment in research and development, with uncertain returns. Moreover, in digital markets, replication can be rapid. For example, Spotify quickly copied many of Netflix's personalisation features for music, whilst numerous coffee chains have developed mobile ordering apps similar to Starbucks. There are also lower barriers to entry due to digital platforms. This results in greater competition so increase in market share may be limited.

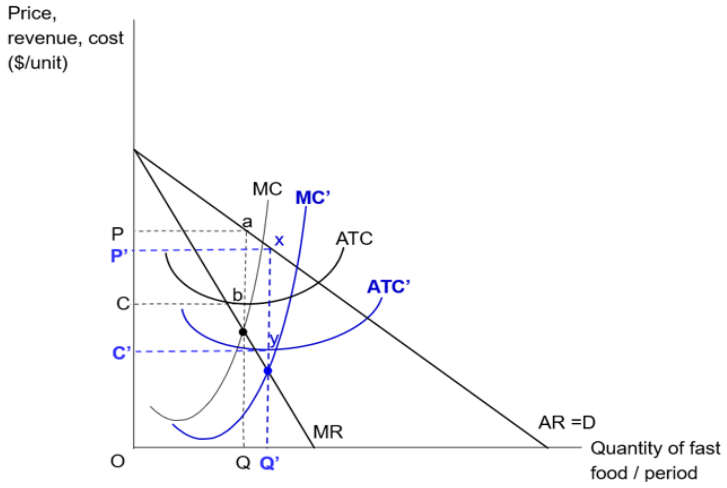
The success of product differentiation also depends on consumer acceptance, for example, some consumers might prefer the lower prices of basic alternatives rather than paying premiums for digital features they don't value. Thus overall, the potential to capture higher TR may be limited and thus product differentiation strategy may not always yield the expected profit increases.

Requirement 2
Explain how cost strategy through the use of digital innovation enables firms to increase profits.

Cost strategy through the use of digital innovation enables firms to increase profits. Digital innovation enables firms to increase profits by reducing production costs via process innovation. Process innovation involves improving the method of production so as to reduce marginal cost of production through having a more efficient production process. The use of automation and robotics can reduce labour costs and reduce possible errors. For example, McDonalds has implemented digital kiosks and mobile ordering systems that reduce labour costs by allowing customers to place orders themselves. Instead of employing multiple cashiers during peak hours, McDonald's can operate with fewer staff whilst serving the same number of customers. The digital

systems also reduce order errors resulting in lower marginal (and average) cost of production. Another example is food delivery platforms like Deliveroo and Foodpanda which use algorithms to optimise delivery routes and match drivers with orders efficiently, reducing fuel costs and delivery times.

The firm is originally producing at output Q where MR=MC and charging price P. It is initially earning a supernormal profit of area PabC. The initial average total cost (ATC) is ATC while the initial marginal cost (MC) is MC. Successful process innovation will result in a fall in both MC and ATC to MC' and ATC' respectively. The new profit-maximising output is now at Q' where MR=MC' and the new price is at P'. Process innovation enables the firm to gain a cost advantage over its rivals, allowing it to lower its price to P' and be more price competitive, thus increasing its profits. With successful process innovation, supernormal profits have increased from PabC to P'xyC'.



[EV] Cost strategies may not be appropriate especially in the service industry where customer service is important. This is because excessive focus on cost cutting might compromise such service delivery. For example, the use of automated customer service systems that replace human support may result in frustrations of consumers and potentially reduce their brand loyalty in the long-term.

Also, digital innovation requires the use of skilled labour to design and maintain the ecosystem, and this may potentially drive up MC & AC. Additionally, the focus on cost reduction may potentially trigger price wars that erode profit margins across the industry.

Conclusion

The appropriateness of product differentiation or cost strategies for harnessing digital innovation to increase firms' profits depends on the type of market structure and the nature of the goods produced. In general, product differentiation strategies tend to be more appropriate in most consumer goods markets.

In oligopolistic markets such as streaming services like Netflix and premium coffee chains like Starbucks, product differentiation strategies are more appropriate. These firms possess the financial resources from sustained supernormal profits to invest heavily in digital innovation whilst facing competitive pressure to innovate continuously. Conversely, in monopolistically competitive markets like local restaurants or independent clothing boutiques, cost strategies may be more suitable as these firms earn normal profits in the long run and lack the financial capability for extensive digital differentiation, making cost efficiency their main strategy to increase profits.

It would be more appropriate for firms that provide goods and services like entertainment, dining experiences or hospitality to adopt product differentiation strategies because consumers cannot fully evaluate quality before purchase, making brand reputation and unique features crucial. In such industries, product differentiation strategies align better with the nature of digital innovation itself, which excels at creating personalised, convenient, and unique customer experiences which then build consumers' loyalty and hence reduces the substitutability of the product. Netflix's personalised recommendations and Starbucks' convenience ecosystem creates perceived value that justifies premium pricing and hence enables the firms to earn higher profits. In contrast, cost strategies would be more appropriate for manufacturing-intensive industries with standardised products, as digital automation and supply chain optimisation can dramatically reduce production costs whilst maintaining quality standards.

Mark Scheme

Level	Descriptors	Marks
L3	Well-explained analysis of at least 2 strategies on product differentiation and cost that a firm can implement to increase profits. Reference made to well-drawn diagrams. Use of relevant examples, taking the context of harnessing digital innovation into consideration.	8 – 10
L2	Under-developed explanation of two product differentiation and cost strategies that a firm can implement to increase profits. Analysis that has some gaps in explanation (cursory explanation). OR Well-developed explanation of either product differentiation or cost strategy.	5 – 7
L1	Some attempt to answer the question without economic explanations or answers that contain obvious flaw(s) in theory.	1 – 4
E3	Evaluative judgements across both requirements are well-developed and backed by sound economic analysis. A summative conclusion that answers the question and takes a stand is provided.	5
E2	Some evaluative comments and attempts at making judgements that are explained using relevant economic analysis.	3 – 4
E1	Superficial evaluative statement(s) without sufficient elaboration.	1 – 2

Question 4

The Singapore Green Plan 2030 is a whole-of-nation movement guiding the country's sustainable development. New opportunities are being created in sustainable industries, with government programs supporting businesses in their green transformation.

(a) Explain how economists know whether the objective of inclusive and sustainable growth has been achieved by an economy. [10]

(b) Discuss the extent to which policies designed to pursue sustainable economic growth by a government will lead to trade-offs in an economy. [15]

(a) Explain how economists know whether the objective of inclusive and sustainable growth has been achieved by an economy. [10]

- **Requirement 1:** Explain the indicator used to measure growth in the economy
- **Requirement 2:** Explain the indicators used to determine that the growth in the economy is inclusive and sustainable

Introduction

Inclusive growth indicates a rate of growth that is sustained over a period of time, is broad-based across economic sectors and creates productive employment opportunities for the majority of the country's population.

Sustainable economic growth refers to a rate of growth that is sustained without creating other significant socio-economic issues (such as depleted resources and environment problems), especially for future generations.

Economists can know whether the objective of inclusive and sustainable growth has been achieved by an economy using indicators such as the real GDP growth rate, Gini coefficient, as well as pollution indices.

Body

<u>Requirement 1: Explain the indicator used to measure growth in the economy</u>

Economists use real Gross Domestic Product (GDP) growth rate to know whether economic growth has been achieved by an economy.

Economic growth is measured using real GDP growth rate, which is the percentage change in a country's real GDP. GDP refers to the value of all final goods and services produced by factors of production located within a country's geographical boundaries, during a period (usually a year). Real GDP measures the value of a country's total final output using constant prices.

Hence, real GDP growth rate measures the rise in actual national output/GDP over time for an economy, and the formula is as follows:

$$\text{Real GDP growth rate} = \frac{\text{Real GDP}_t - \text{Real GDP}_{t-1}}{\text{Real GDP}_{t-1}} \times 100\%$$

Real GDP measures a country's level of economic activity and performance. When the real GDP growth rate is positive, it means that the quantity of the country's final output has increased, rather than a mere rise in money value of GDP. A positive real GDP growth rate therefore indicates economic growth. On the other hand, a negative real GDP growth rate means a fall in a country's actual national output. When the real GDP growth rate is negative in value for two successive quarters, it means that the economy is in a recession where the national output is falling. For example, in 2020, when the COVID-19 pandemic broke out, many countries all over the world experienced poor economic performance with year-on-year negative economic growth rates. On the other hand, when economies began to recover in 2022, countries recorded positive growth rates, with those with strong recovery showing higher economic growth rates.

Hence, economists will use real GDP growth rates to know whether the economy is experiencing economic growth, which is necessary to achieve inclusive and sustainable growth.

Requirement 2: Explain the indicators used to determine that the growth in the economy is inclusive and sustainable

Additionally, economists will also use Gini coefficient as a supplementary indicator to know whether economic growth achieved by an economy is inclusive.

The Gini coefficient measures the degree of inequality in income distribution across a population. **It takes on a value between 0 and 1, where 0 represents perfect income equality. The greater the Gini coefficient and the closer it is to 1, the greater is the income inequality within the nation where one person has all the income whilst everyone else has nothing.**

Economists can also look at how the Gini coefficient changes over time to understand how income distribution has changed. If the Gini coefficient of a country increases over time, it implies widening income inequality within a country and vice versa. For instance, Japan's Gini coefficient has been on the rising trend, indicating that income distribution has become more unequal. Hence, even if national income is increasing, the larger Gini coefficient would indicate that the rise in national income is not equally distributed among households, since the increase in income would have been concentrated in the hands of the rich minority, and an average individual would not have seen much rise in income. Hence, inclusive growth has not been achieved in this case. On the other hand, if the Gini coefficient decreases, such as in Singapore's case where Gini coefficient has decreased from 0.464 in 2014 to 0.433 in 2023, this indicates that income inequality has fallen. Hence, any rise in national income would be more equally distributed among the individuals in the country and the growth enjoyed would be more inclusive.

Therefore, economists can use Gini coefficient as a supplementary indicator to determine whether inclusive economic growth has been achieved.

Economists can also use pollution indicators, such as the Air Quality Index (AQI), as a supplementary indicator to know whether economic growth achieved by an economy is sustainable.

The Air Quality Index is based on measurement of particulate matter (PM2.5 and PM10). The AQI is color-coded for easier understanding, with ranges like “Good” (0-50), “Moderate” (51-100), “Unhealthy” (151-200), and “Hazardous” (over 300). As air pollution levels rise, so does the AQI, along with the associated public health risk. For example, if a country’s national income is rising, and it is accompanied by a fall in the AQI, this suggests that the economic growth that is achieved is sustainable since there is less pollution generated even as the economy is growing. On the other hand, if a country’s national income is rising, and the AQI also rises, this suggests that the economic growth that is achieved is at the expense of the environment. In this case, sustainable growth is not achieved because the rising air pollution and worsening environmental degradation would have negative impacts on long-term growth. For example, poorer air quality can lead to a fall in labour productivity, as the high pollution levels reduce cognitive function and increase sick days. Foreign investors might also avoid investing in heavily polluted areas, and hence quantity and quality of capital may also fall. This would lead to a fall in productive capacity in the longer term, and hence sustainable growth would not be achieved.

Therefore, economists can use pollution indicators as a supplementary indicator to determine whether sustainable economic growth has been achieved.

Alternative possible indicators (for resource depletion):

Deforestation rates: *Deforestation rate reveals sustainability by showing whether economic growth is depleting forest capital faster than it can be regenerated or replaced. When deforestation rates are high during periods of economic growth, it indicates the economy is growing but at the expense of depleting natural resources like forest cover, a finite natural resource. The achievement of sustainable economic growth should show stable or declining deforestation rates even as the economy expands. This suggests the country is achieving growth through productivity improvements, technological innovation, or economic diversification rather than simply expanding the physical footprint of economic activity. Costa Rica exemplifies this pattern as its economy grew substantially while forest cover actually increased through reforestation and ecotourism development.*

Reserves-to-production ratio: *The reserves-to-production ratio is a measurement that estimates how many years a non-renewable resource, like oil or natural gas, will last at current consumption rates. The ratio provides crucial insights into sustainability by revealing whether current economic growth rates can be maintained given finite resource constraints. When the ratio is declining rapidly as national income is rising, it suggests that economic growth is consuming resources faster than new reserves are being discovered or developed. E.g. If a country's oil reserves-to-production ratio drops from 50 years to 20 years over a decade, this indicates that current growth patterns are depleting the resource base at an unsustainable pace. The economy is essentially depleting its source of natural resources to fuel present consumption and production.*

Mark Scheme

Level	Descriptor	Marks
L3	Both the indicators for economic growth, as well as inclusiveness and sustainability, are considered. Accurate and well-developed explanation of the 3 indicators with examples.	8 – 10
L2	Incomplete or under-developed explanation of how the 3 indicators measure whether the objective of inclusive and sustainable growth has been achieved.	5 – 7
L1	An answer that is only able to identify or define the relevant indicators. Response shows little understanding of the interpretation of the indicators. There are major errors in the explanation.	1 – 4

(b) Discuss the extent to which policies designed to pursue sustainable economic growth by a government will lead to trade-offs in an economy. *[15]*

- **Requirement 1:** Explain how one policy designed to pursue sustainable economic growth by a government may lead to a trade-off in an economy
- **Requirement 2:** Explain how another policy designed to pursue sustainable economic growth by a government may lead to another trade-off in an economy

Introduction

The government's macroeconomic objectives include inclusive and sustainable economic growth, price stability, low unemployment and a favourable balance of trade. In implementing policies to achieve inclusive and sustainable growth, trade-offs with other objectives may occur.

Body

<u>Requirement 1: Explain how one policy designed to pursue sustainable economic growth by a government may lead to a trade-off in an economy</u>

The pursuit of sustainable economic growth by a government through expansionary fiscal policy may lead to a trade-off with demand-pull inflation in the short term.

To pursue sustainable economic growth, a government could increase government expenditure (G) directly on green infrastructure, such as solar panels and wind turbines to harness renewable energy. The development of green infrastructure can mitigate negative environmental impacts and protect the environment by slowing down global warming and slowing down the depletion of natural resources like fossil fuels. Additionally, the rise in G increases aggregate demand (AD), and AD shifts rightwards from AD_1 to AD_2 (Figure 1).

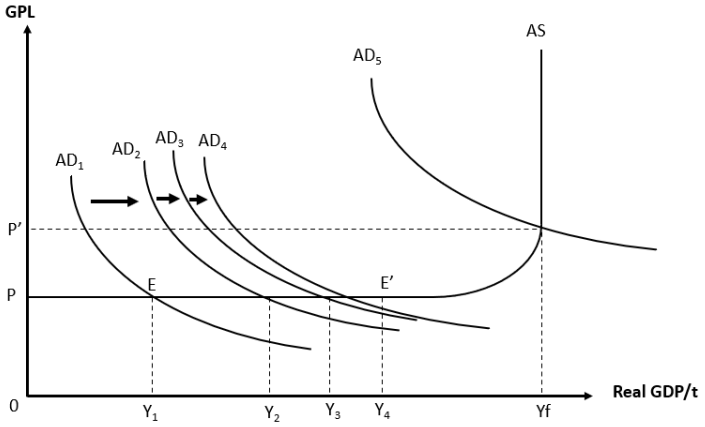


Figure 1: Actual economic growth from rise in G

When AD increases from AD_1 to AD_2, firms face an unplanned fall in inventories and will hire more factors of production such as labour to increase production. Assuming that there is spare capacity in the economy, this will lead to an increase in the real national income from Y_1 to Y_2. This increase in national income increases the purchasing power of households, which in turn leads to a further increase in consumption of domestic goods. Part of the increase in income will also be saved, taxed, and spent on imports. AD continues to increase from AD_2 to AD_3

from the increase in induced consumption, which causes further unplanned falls in inventories and further rounds of the multiplier effect. This process results in a multiplied increase in real national income and will continue until the initial increase in government expenditure (injections) equals the increase in total withdrawals. As a result, the economy achieves actual economic growth illustrated by a rise in real GDP from Y_1 to Y_4.

However, if the government overestimates the rise in G to boost growth, the use of expansionary fiscal policy could lead to a trade-off in the short term with demand-pull inflation. Should the government overestimate the rise in G and increases G significantly, AD rises significantly to AD_5 instead. The rise in AD would lead to a fall in firms' inventories, and firms will hire more FOPs to increase production. However, since AD is rising close to full employment, to produce more output, firms are forced to use resources that are less and less suitable for production, causing UCOP to rise. Firms will be willing to produce more only at higher prices (i.e. AS slopes upwards), so GPL rises from P to P', leading to demand-pull inflation.

Hence, the pursuit of sustainable economic growth by a government through expansionary fiscal policy may lead to a trade-off with demand-pull inflation in the short term.

[Ev] The extent to which the trade-off will occur will depend on the state of the economy and the time period. For an economy with a fairly low unemployment rate such as in the case of Singapore, it is likely that there is a lack of spare capacity. Hence, should the government choose to employ expansionary fiscal policy to achieve sustainable growth, the rise in G would more likely result in AD rising closer to Yf and hence demand-pull inflation, resulting in a trade-off with the goal of price stability to a large extent in the short term. Although the infrastructure development will lead to an increase in AS, this usually takes some time before results can be observed. In the longer term when the rise in productive capacity materialises, the sustainable growth can then happen without demand-pull inflationary pressures, and hence the trade-offs would be to a smaller extent in the longer term.

Requirement 2: Explain how another policy designed to pursue sustainable economic growth by a government may lead to another trade-off in an economy

The pursuit of sustainable economic growth by a government through supply side policies may lead to trade-off with unemployment.

The government can pursue sustainable economic growth through the use of supply-side policies, such as providing subsidies or grants to firms to encourage R&D. By providing funding to firms to conduct R&D, it lowers the cost of doing R&D such that firms would be more willing and able to conduct R&D. For example, should firms conduct R&D in the form of process innovation, their production processes can be improved, increasing efficiency and productivity, and hence the output per unit input increases. Thus, firms can use less factors of production (FOP) to produce the same output, leading to a fall in unit cost of production.

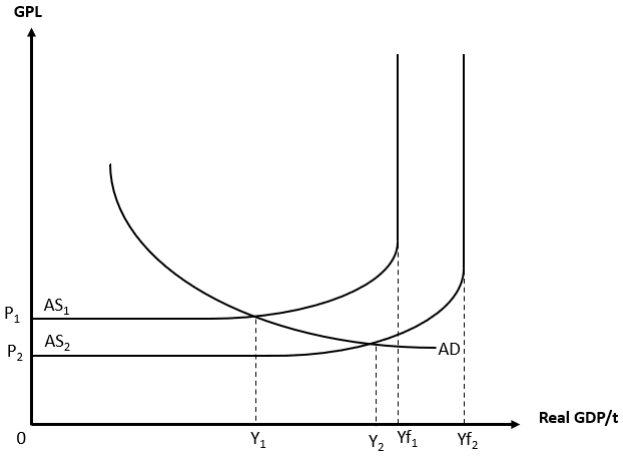


Figure 2: Impact of SSP

The fall in UCOP increases AS from AS_1 to AS_2 (Figure 2) as profit-motivated firms will be willing to continue producing the same output level at lower prices. Firms will then pass on the cost savings by lowering the price of their goods and services, leading to a fall in GPL from P_1 to P_2. With a fall in GPL, assuming unchanged nominal wealth, the real value of household wealth increases. As the households now feel wealthier, they are thus more willing to consume more goods and services at this lower GPL. Hence, consumption rises, causing a rise in equilibrium real GDP (represented as a movement along AD curve when GPL falls) from Y_1 to Y_2, leading to actual growth. Additionally, since the production process is more efficient and uses less FOP, which includes pollutive FOPs such as fossil fuels, there would be an improvement in environmental sustainability.

Moreover, through R&D, the quality of capital increases. This will increase the productive capacity of the country, leading to a rise in aggregate supply (AS), illustrated by a rightward shift of the vertical AS curve from AS_1 to AS_2 in Figure 2 above. Full employment real GDP increases from Yf_1 to Yf_2. Such potential economic growth enables the economy to grow beyond the initial Yf for growth to be sustained.

However, the achievement of sustainable economic growth from encouraging R&D may lead to a trade-off with unemployment, as structural unemployment may result. As the economy transits towards becoming a low-carbon economy through the development of cheaper and greener methods of production, 'new opportunities are being created in sustainable industries', for example in green finance, carbon services and trading, and sustainable tourism. However, workers in traditionally pollutive industries such as the petrochemical industry may become unemployed and since they do not have the relevant skills to enter the green industries where new jobs are created, they will be structurally unemployed.

Hence, the pursuit of sustainable economic growth by a government through supply side policies may lead to a trade-off with unemployment.

[Ev] The trade-off between the achievement of sustainable economic growth and unemployment may be more significant for developing economies as compared to developed economies. This is because while this trade-off can be mitigated by complementary policies (e.g. government grants for skills training which allows workers to undergo training and allow

retrenched workers to equip themselves with relevant new skills and increase occupational mobility), workers in developing economies are more likely to possess a lower education level and hence retraining efforts may be less successful, and occupational immobility is more likely to persist. Moreover, developing economies may also lack the necessary infrastructure required to conduct retraining, which may limit the success of retraining efforts. This is in contrast to developed economies, where generally a large proportion of the population are of a higher education level, which would make retraining much easier since it is more likely that workers are able to be trained. Hence, achieving sustainable economic growth would lead to a trade-off with structural unemployment more significantly, i.e., to a larger extent in developing economies than developed economies.

Conclusion

In conclusion, the extent to which policies designed to pursue sustainable economic growth by a government will lead to trade-offs in an economy depends on the choice of policies taken by the government, and whether the government has the ability to mitigate the trade-offs that occur.

The choice of policies designed to pursue sustainable economic growth by a government will influence the extent to which the trade-off will occur. Should the government choose to employ only a single policy like expansionary fiscal policy to achieve sustainable economic growth, the trade-offs will likely occur to a large extent. On the other hand, if the government chooses to employ a mix of different supply side policies to achieve sustainable economic growth, the extent to which the trade-off will occur will likely be much smaller since the various policies would be able to address the limitations of the others to prevent the trade-offs from occurring.

Additionally, the extent to which policies designed to pursue sustainable economic growth by a government will lead to trade-offs will depend on whether the government has the ability to mitigate the trade-offs that occur. In the case of the trade-off with unemployment, the government can mitigate the trade-off using complementary policies such as encouraging workers to go for reskilling. Doing so would likely require the government to spend on subsidies for training courses, such as in the case of Singapore. For example, Singapore's SkillsFuture Credit Scheme allows workers to make use of the credits to offset a part of the costs of training courses, encouraging more workers to attend training to learn new and relevant skills for the green industries. Moreover, the government may also need to spend on developing the relevant infrastructure (e.g. training institutions). If the government is facing a budget surplus, such as Singapore, which has historically maintained budget surpluses in most years, it will most likely have the ability to carry out complementary policies to mitigate any trade-offs that occur. Hence, for countries like Singapore, the trade-offs would only occur to a small extent since the trade-offs can be mitigated. On the other hand, if the government is consistently facing budget deficits, such as Greece or Argentina, their ability to mitigate the trade-offs may be constrained by the tax revenue that is collected and hence the trade-offs would occur to a large extent for these countries.

Mark Scheme

Level	Descriptor	Marks
L3	Analytical and well-developed answer that demonstrates understanding of how different government policies may lead to trade-offs with other objectives.	8 – 10
L2	Incomplete or under-developed explanation of how different government policies may lead to trade-offs with other objectives. OR only 1 requirement is addressed.	5 – 7
L1	Demonstrates brief knowledge about sustainable economic growth or government policies or trade-offs between objectives. Answer may be vague or ridden with conceptual errors.	1 – 4
Evaluation		
E3	Well-developed evaluation of the extent of trade-offs between sustainable economic growth and other objectives, with reference to relevant examples / contexts, and a clear stand with a summative conclusion is provided	5
E2	Some attempt to evaluate the extent of trade-offs between sustainable economic growth and other objectives, with reference to relevant examples / contexts.	3 – 4
E1	A brief evaluation attempt is made in the form of simple evaluative statements (i.e. judgements) that are weakly substantiated.	1 – 2

Question 5

A low and stable rate of inflation is a key macroeconomic policy objective for most governments. During 2022 to 2023, many central banks around the world raised interest rates to combat rising inflation.

(a) Explain why inflation and deflation might be reasons for concern for a government.
[10]

(b) Discuss whether a rise in interest rates in other countries would have an overall adverse impact on Singapore's economy.
[15]

Part (a)

R1: Explain why inflation is a concern for the government (i.e. negative consequences of high inflation).

R2: Explain why deflation is a concern for the government (i.e. negative consequences of deflation).

Introduction

Inflation is a situation where there is a sustained increase in general price level of an economy. Deflation is the sustained decrease in general price level. A government's goal is to achieve low and stable inflation, thus having a high inflation rate or deflation are reasons for concern for a government as they have adverse impacts on the economy.

R1: Explain why inflation is a concern for the government (i.e. negative consequences of high inflation).

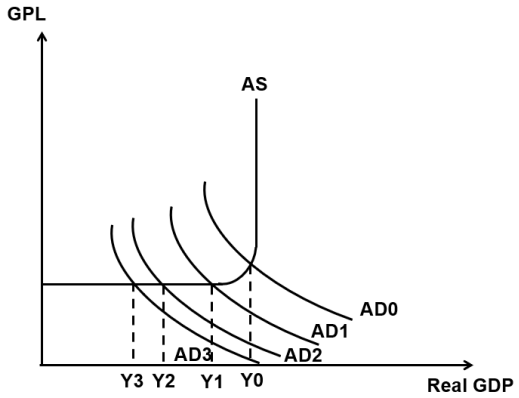
Inflation leads to worsening of a country's trade balance.
If a country has an inflation rate that is higher than that in other countries and assuming no change in the prices in other countries, locally produced goods become relatively more expensive compared to imports, leading to higher import demand and hence import expenditure, as domestic residents switch to the relatively cheaper imported goods and services instead of consuming domestically produced goods and services. In addition, exports will become less price competitive in the world markets leading to foreigners decreasing quantity demanded for exports. Assuming the demand for exports is price elastic (due to the availability of many substitutes in the global market), there will be a fall in export revenue since the fall in revenue from the more than proportionate fall in quantity demanded will be greater than the gain in revenue from the higher prices. Hence, the fall in export revenue and rise in import expenditure will result in a fall in (X-M) and cause the country's balance of trade to deteriorate.

Inflation can thus be damaging since it worsens the trade balance of a country, especially if the country is suffering from a trade deficit already.

Inflation can worsen material standard of living (SOL).
In times of inflation, if a household's nominal income rises more slowly than the general price level (GPL) or if its nominal income remains unchanged, real income falls and there will be a fall in purchasing power and hence a fall in the amount of goods and services that households can consume, leading to a deterioration in material SOL.

Alternative Point:

High inflation can bring about adverse impacts on economic growth and unemployment. If inflation is high and rising, investment will be discouraged. High levels of inflation increase the uncertainty of investment decisions, making it difficult for firms to predict their costs and revenues since inflation distorts price signals, i.e. expected rates of returns are volatile. Thus, firms will become less willing to invest in capital goods. Assuming that the inflation is prolonged and severe such that it will cause a significant fall in I and hence aggregate demand (AD) falls by a large extent from AD_0 to AD_1 in the economy (note that this is a fall in AD from the upward-sloping AS to the horizontal AS with spare capacity on the diagram), this causes an unplanned increase in inventories. Firms will cut back on production by employing less factors of production (e.g. labour) since labour is a derived demand and assuming wages are 'sticky' downwards. Therefore, demand deficient unemployment rises and national income falls. The fall in national income leads to households reducing induced consumption on domestic goods and services and causing AD to fall again. This creates another round of unplanned increase in inventories in other industries and the process repeats until injections = withdrawals once more, leading to a multiplied fall in national income from Y_0 to Y_3 since there is now spare capacity. Negative actual growth and demand-deficient unemployment results.



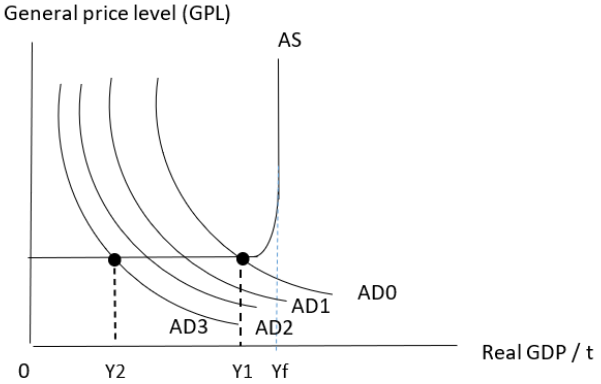
R2: Explain why deflation is a concern for the government (i.e. negative consequences of deflation).

Prolonged deflation may lead to adverse impacts on economic growth and demand-deficient unemployment.

Assume the economy is experiencing supply-side deflation and is operating at spare capacity**.** If the deflation is prolonged, consumers may anticipate that prices will continue to fall and thus cut back on current consumption so that they may buy the goods at a cheaper price later on. In addition, the fall in GPL leads to an increase in the real interest rate since real interest rate = nominal interest rate – inflation rate. This

higher cost of borrowing will discourage firms from investing as the marginal cost of investment will exceed the expected rate of returns of investment for some projects. Moreover, if deflation encourages consumers to defer consumption, the expected rate of return of investment also falls, which also discourages investment.

The fall in consumption and investment expenditure will lower AD from AD_0 to AD_1 in the economy, causing an unplanned increase in inventories. Firms will cut back on production by employing less factors of production (e.g. labour) since labour is a derived demand and assuming wages are 'sticky' downwards. Therefore, demand deficient unemployment rises and national income falls. The fall in national income leads to households reducing induced consumption on domestic goods and services and causing AD to fall again. This creates another round of unplanned increase in inventories in other industries and the process repeats until injections = withdrawals once more, leading to a multiplied fall in national income from Y_0 to Y_2 assuming that there is spare capacity. Negative actual growth and demand-deficient unemployment results.



Moreover, potential growth may also be adversely affected if the fall in investment results in a slowdown in the expansion of the country's capital stock assuming gross investment still exceeds capital depreciation, causing a slowdown in the rise in AS and Y_f. Thus, potential growth slows.

Hence, deflation, if prolonged can have adverse impacts on actual and potential growth and demand deficient unemployment.

<u>Alternative point:</u>
Deflation may worsen SOL of households in the economy, especially if prolonged. Deflation can have a negative impact on households as deflation causes real value of debt to increase and real interest rates to increase. When real interest rates increase, cost of borrowing will increase for households. When real value of debt increases, households would find it more expensive to borrow as the amount they pay back would be higher in real value. Thus, they will experience a fall in material standard of living as they will borrow less to spend on big-ticket items like cars and overseas vacations when general price levels are falling.

Mark Scheme

Level	Descriptors	Marks
L3	Analytical and developed explanation of the negative consequences of both inflation and deflation. Response should also have sufficient scope (i.e. have a good spread of points, for example - impact on different macro goals).	8 – 10
L2	Descriptive explanation of the negative consequences of inflation and deflation. Answer may contain some errors. Or Developed explanation of the negative consequences of inflation or deflation.	5 – 7
L1	Demonstrates knowledge about concepts and consequences of inflation or/and deflation. Answer may be vague or contains serious conceptual errors.	1 – 4

Part (b)

Discuss whether a rise in interest rates in other countries would have an overall adverse impact on Singapore's economy.

[15]

R1: Explain why a rise in interest rates in other countries may have an adverse impact on Singapore's economy.

R2: Explain why a rise in interest rates in other countries may have a beneficial impact on Singapore's economy.

Introduction

Interest rates refer to the cost of borrowing or the returns to savings. Singapore is a small and open economy, highly dependent on trade with other countries. Thus, contractionary interest rate monetary policy adopted by other countries, especially our trading partners, to combat inflation in their countries will impact Singapore's economy. To determine whether a rise in world interest rates would have an overall adverse impact on Singapore's economy, we would have to weigh the costs and benefits to the economy relating to economic growth, inflation, unemployment as well as the balance of trade.

R1: Explain why a rise in interest rates in other countries may have an adverse impact on Singapore's economy

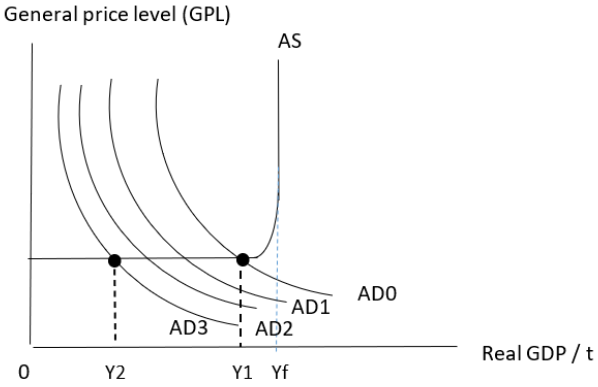
A rise in interest rates in other countries will result in negative actual growth and demand deficient unemployment due to the rise in domestic interest rates in tandem with the world interest rates and contractionary effect on other economies.

Since Singapore is a small economy and thus is a price taker for interest rate, this means that interest rates in Singapore would also rise in tandem with foreign interest rates. A rise in domestic interest rates would mean that the cost of borrowing increases. For firms, this will mean an increase in the marginal cost of investment. There will now be units of investment for which the expected rate of returns (MB of investment) is now lower than the interest rate (MC), and hence are now unprofitable, resulting in a decrease in investment expenditure (I). Households may also decrease consumption expenditure on big ticket items financed by loans. In addition, consumers will receive higher returns on their savings which increases the opportunity cost of consumption. Hence, consumption expenditure (C) falls. Thus, the rise in domestic interest rate would **reduce consumption expenditure (C) and Investment expenditure (I)** in Singapore.

Moreover, the rise in interest rate in other countries (e.g. US) would have also resulted in a fall in C and I in US similar to the above impact, which will cause AD of US to fall. Assuming that US is not at full employment, this results in a multiplied fall in the real GDP of US. The fall in real GDP in US will result in a fall in the Americans' purchasing power, and hence demand for goods and services, including imports from Singapore

will fall, assuming these goods are normal goods where YED>0, causing a **fall in export revenue** (X) of Singapore.

Hence, the fall in X, C and I in Singapore will cause a fall in Singapore's AD from AD_0 to AD_1. The fall in AD will cause AD to be less than current output and hence there will be an unplanned rise in firms' inventories. Firms will reduce production and hire less factors of production, such as labour since labour is a derived demand. As a result, households' income will decrease and this will result in a fall in induced consumption of other domestic goods and services, causing a subsequent fall in AD from AD_1 to AD_2. This will trigger another round of unplanned rise in inventories, and the process continues until total withdrawals equal total injections. *The downward multiplier process would lead to a multiplied fall in real GDP to Y_2, assuming there is spare capacity and result in negative actual economic growth in Singapore. The increase in output gap from (Y_f-Y_1) to (Y_f-Y_2) also reflects an increase in demand-deficient unemployment.



Other possible adverse impacts:

- BOT: Assuming import expenditure remains constant, the fall in Singapore's X will have an adverse impact on its balance of trade (BOT).
- Material SOL: Assuming population size is unchanged, the fall in real GDP will reduce the purchasing power and ability of residents to consume goods and services. Material SOL worsens.
- Potential growth: The fall in Singapore's I due to the rise in domestic interest rate may slow down capital accumulation (assuming gross investment is still greater than capital depreciation), resulting in a slower increase in AS and Y_f, thus potential growth may slow. [or even be negative if capital stock falls].

<u>Any 1 or 2:</u>

[Ev – proportion of X in AD] The adverse impact on Singapore's actual growth is likely to be significant. As Singapore is a very open economy that is heavily reliant on trade (**exports** accounts for about 175% of GDP in 2020), the fall in X will impact Singapore's AD significantly, thus the fall in real GDP and impact on growth will be significant.

[Ev – key trading partners] The adverse impact on Singapore's actual growth is likely to be significant as many of our key trading partners (key export destinations) are affected by the rise in interest rates in their countries. The pre-amble states that many

central banks around the world have raised interest rates, hence it is likely that this may include many of Singapore's key trading partners such as the US, EU and Malaysia. Hence, the extent of the fall in Singapore's X will be significant as demand for Singapore's exports by many of our key trading partners will fall. Thus, the fall in interest rates in their countries is likely to lead to significant negative growth in Singapore.

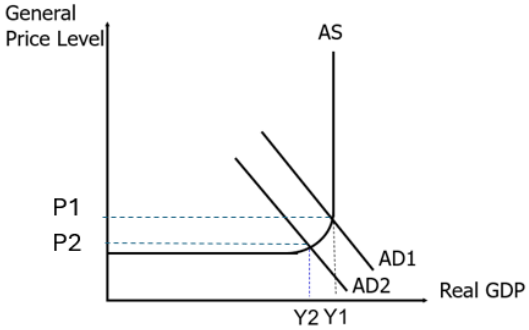
[Ev – multiplier size] The extent of the fall in real GDP and adverse impact on actual growth is likely to be limited due to Singapore's small multiplier size. The size of Singapore's multiplier is small due to its high marginal propensity to withdraw (MPW) since multiplier (k) = 1/MPW. Our marginal propensity to import (MPM) is high given our lack of natural resources while our marginal propensity to save (MPS) is high due to CPF contributions and the Asian culture of thrift. This results in a high MPW (which includes MPS, MPT and MPM) and hence multiplier size is small in Singapore. Hence, the extent of the fall in real GDP will be dampened since more of the decreased income is intended as withdrawals from the circular flow of income at every round and less of the decreased income is 'injected' back into the economy via the consumption of domestic goods and services.

[Ev – economic outlook] The extent of the negative impact on Singapore's economic growth depends on consumer and business sentiments. If consumer and business sentiments are very optimistic in Singapore or in the other countries (e.g. due to the strong economic rebound post-COVID pandemic in the 2022-2023 period, which might be the reason for an increase in foreign interest rates by Central Banks to dampen overheating), the rise in interest rate globally and domestically may not discourage C and I significantly in both Singapore and foreign countries. C and I may thus be interest rate inelastic as consumers and investors may be unresponsive to the rise in interest rate due to positive economic outlook. The extent of the fall in Singapore's AD and real GDP may be insignificant in such instances.

[Ev – extent of the interest rate rise] The extent of the negative impact on Singapore's economic growth may also depend on extent of the rise in interest rate. If the Central Banks of other countries raise interest rate by a large extent or multiple times in a year (e.g. the US Federal Reserve raised interest rate a total of 11 times between 2022 and 2023, with a large rise in June 2022, where it raised interest rate by a 0.75 percentage point increase, the largest increase since 1994), it is likely to have a more significant contractionary effect on the real GDP of other countries' and hence a more severe adverse impact on Singapore's X and AD.

R2: Explain why a rise in interest rates in other countries may have a beneficial impact on Singapore's economy

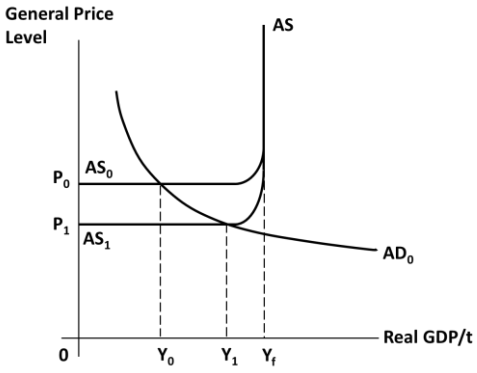
A rise in interest rates in other countries may reduce inflationary pressures in Singapore. If the Singapore economy is operating near full employment, the fall in AD from AD_1 to AD_2 will result in a fall in general price level (GPL) from P_1 to P_2, reducing demand pull inflationary pressures. This is because when output is reduced, the resulting rise in unemployment means that firms are better able to get the resources that they need, resulting in more efficient factor combinations and falling unit cost of production. Hence, firms are willing to sell the lower output at lower prices, resulting in a fall in GPL, reducing demand-pull inflationary pressures.



[Ev - state of economy] This impact on dampening inflation is very likely in Singapore's context. Singapore's unemployment rate is relatively low, thus the economy is likely to be operating near full employment. Moreover, in 2022-2023 period, Singapore is also facing inflationary pressures partly caused by the strong global economic recovery post-COVID pandemic. Hence, the rise in foreign interest rates, especially in our key trading partners will likely help in dampening AD and inflation in Singapore to a large extent.

Alternative Point:

The rise in interest rate in other countries which resulted in a fall in AD of other countries as explained earlier will also result in a fall in GPL in the foreign countries (especially since the rise in interest rate by foreign central banks was to combat inflationary pressures in these countries). This will cause a fall in prices of imported key factor inputs for Singapore, leading to a fall in unit cost of production. Singapore's AS will increase from AS_0 to AS_1 as firms are more willing and able to produce the same output at lower prices, resulting in a fall in GPL from P_0 to P_1, thus relieving imported inflation in Singapore.



Conclusion

Overall, the negative impacts are likely to outweigh the positive and the rise in interest rate in other countries is likely to have an overall adverse impact on Singapore's economy.

[Ev – nature of economy] Being a small and open economy who is highly reliant on trade and is a price taker in interest rates, Singapore is highly affected by changes in interest rate in other countries and growth rates of other economies around the world. The contractionary effect of the rise in interest rates on many of Singapore's major trading partners (i.e. export destinations for our goods and services) such as USA and EU will bring about a significant adverse impact on Singapore's X. Since X makes up a significant proportion of Singapore's GDP (exports accounts for about 175% of GDP in 2020), this will impact Singapore's AD and economic growth to a large extent.

[Ev – economic outlook] Moreover, the extent of the negative impact on Singapore will also depend on consumer and investor confidence. In light of global uncertainties caused by the ongoing US-China trade tensions, China's slower than expected post-COVID recovery, and growing protectionistic sentiments among countries etc., economic outlook is likely to be more cautious and pessimistic in both Singapore and the global economy. Hence, the rise in interest rate is likely to have an adverse impact on C and I, further contributing to the fall in AD and contractionary effects on Singapore's economic growth.

Hence, the rise in interest rate in other countries is likely to be an overall adverse impact on Singapore's economy.

Mark Scheme:

Knowledge, Application, Understanding, Analysis		
L3	A balanced, analytical and well-developed response which analyses the impact of a rise in interest rate in other countries on Singapore's economy. Response covers both requirements and considers the context of Singapore.	8-10
L2	An underdeveloped explanation of both the positive and negative impacts of a rise in interest rate in other countries on Singapore's economy. OR A developed but one-sided explanation on either the positive or negative impact of the rise in interest rate in other countries on Singapore's economy. A balanced, developed response that lacks scope or is contradictory/repetitive in analysis will score in L2.	5-7
L1	Answer demonstrates some relevant knowledge of the impact of a rise in interest rate in other countries on Singapore's economy. Serious conceptual errors may be present.	1-4
Evaluation		
E3	Both requirements are well-evaluated, i.e., extent or likelihood of the impact in the context of Singapore is considered, and a summative conclusion (with judgement on whether overall, the impact of a rise in interest rate in other countries on Singapore's economy is positive or negative) is provided. Judgement(s) are well-supported with good contextualisation to the Singapore economy.	5
E2	Some attempt to evaluate the significance of the benefits and costs of the rise in interest rate in other countries on Singapore's economy.	3-4
E1	A brief evaluation attempt is made in the form of simple evaluative statements that are weakly substantiated.	1-2

Question 6

As major economies turn inward and global supply chains face increasing vulnerabilities, the globalisation model that has driven growth for decades is under scrutiny.

(a) Explain the main reasons for the growing backlash against globalisation. [10]

(b) Discuss whether policies to deepen human capital development or expand external trade networks would be more effective in safeguarding Singapore's long-term economic performance.

[15]

Part (a)

R1: Explain first reason for the growing backlash against globalisation.
R2: Explain second reason for the growing backlash against globalisation.

Note: *The answer should cover at least two aspects of globalisation to provide sufficient scope.*

Introduction

Globalisation refers to the increasing integration of national economies through flows of trade, investment, capital, information, and labour. The main reasons for the growing backlash can be analysed by considering globalisation's negative impact on economies.

Body

One major reason for the backlash is the perception that globalisation causes structural unemployment and exacerbates income inequality.

In the United States, manufacturing job losses in the "Rust Belt" have been attributed partly to offshoring, as trade liberalisation through NAFTA and China's WTO accession lowered trade barriers and gave firms greater incentive to relocate production to countries with lower labour costs. When there is free movement of goods/services, countries will experience structural changes.

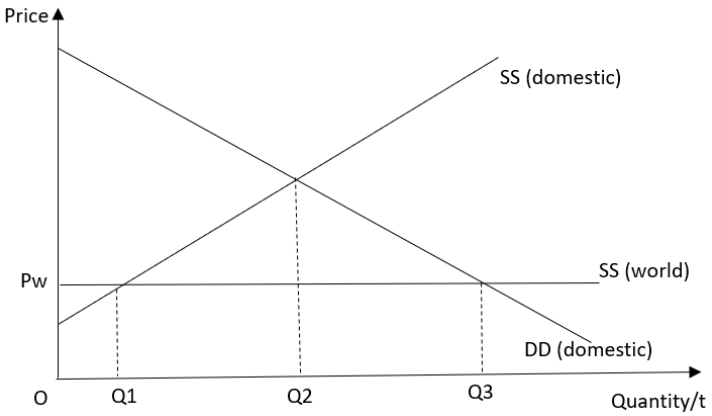


Figure 6.1

With reference to Figure 6.1, the country will import Q1 to Q3 units of goods/services which the country has comparative disadvantage in, because residents will choose to buy the

relatively cheaper imported substitute, priced at Pw. Domestic firms will lower their quantity supplied for the goods/services from Q2 to Q1.

The domestic firms selling substitutes for the imports will in turn lower their demand for labour. This leads to structural unemployment due to the occupational immobility of workers. While globalisation enables the exporting sectors with comparative advantage (CA) to expand, which leads to job creation, those who lost their jobs in the import competing sectors may not have the relevant skills to take up the job openings in the exporting sectors. This results in inter-industry structural unemployment and worsens the income inequality between those involved in export orientated industries and import competing industries.

Free movement of capital can also lead to structural unemployment. For example, in a bid to cut costs, US MNCs have been offshoring some aspects of their production processes to developing countries like China / India / Mexico where labour costs are relatively cheaper. The resulting closure of plants in the USA led to job losses in the USA, increasing structural unemployment if workers lack the relevant skills to take up available job openings, and hence anti-globalisation sentiments.

Alternative: Additionally, globalisation through long-term capital flows such as FDI also brings technology transfer and diffusion, leading to greater automation and a shift in the composition of jobs within industries. While this can raise productivity, it can also cause structural unemployment as certain lower-skilled roles become obsolete and displaced workers are occupationally immobile, unable to take up newly created jobs requiring higher skills or qualifications.

This displacement can also worsen income inequality, as high-skilled workers in technologically advanced sectors enjoy rising wages, while displaced low-skilled workers face wage stagnation or job loss. For example, in Malaysia's electronics manufacturing sector, foreign MNC investment has accelerated automation, reducing demand for assembly-line workers while increasing demand for engineers and technicians, widening the wage gap.

This illustrates how globalisation can drive structural unemployment and widen income inequality, fuelling anti-globalisation sentiment.

A second key reason is that globalisation exposes economies to supply chain vulnerabilities due to external shocks.

Highly globalised supply chains are efficient under normal conditions due to economies of scale and lower average costs from specialisation. The COVID-19 pandemic disrupted manufacturing hubs and cross-border logistics, leading to shortages in essential goods such as semiconductors, pharmaceuticals, and medical equipment. Similarly, geopolitical tensions — such as the US-China trade war or Russia's invasion of Ukraine — have disrupted supply of key commodities like energy and wheat. For small, open economies like Singapore, heavy reliance on imported inputs means that price hikes arising from such shortages will raise the unit cost of production and profit-motivated firms will be willing to continue producing the same output level only if they receive higher prices. Thus, AS falls as represented by the horizontal segment of the AS curve shifting upward from AS to AS' in Figure 6.2 below. This causes the equilibrium GPL to rise from P to P' as firms pass the higher unit costs on to consumers as higher prices.

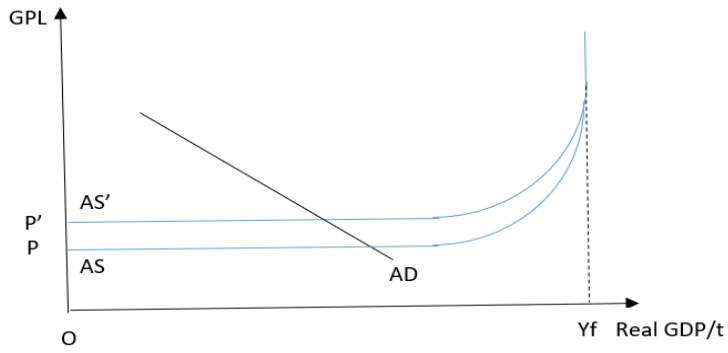


Figure 6.2

The import dependency and vulnerability to imported inflation that globalisation creates has also contributed to this growing backlash.

Note: *An alternative analysis could consider the external shock of recession faced by trade partners.*

Mark Scheme

Level	Descriptor	Marks
L3	Well-developed analytical explanation of two reasons with examples. At least two aspects of globalisation are covered.	8 – 10
L2	Cursory (insufficient economic analysis) explanation of both reasons. OR A well-developed analytical and contextual explanation of only 1 reason.	5 – 7
L1	There is relevant knowledge (e.g. definitions of relevant concepts) but the question is not addressed. There may be major errors in the explanation.	1 – 4

Part (b)

R1: Explain how deepening human capital development can help Singapore safeguard its long-term economic performance.

R2: Explain how expanding external trade networks can help Singapore safeguard its long-term economic performance.

Introduction

The recent backlash against globalisation poses risks to Singapore's small, open economy, as greater protectionism and disrupted trade flows can weaken its long-term growth prospects. This essay will therefore examine how the two stated policies — deepening human capital and expanding trade networks — can safeguard Singapore's economic performance by supporting sustained growth in the face of such challenges.

Body

Deepening human capital development can help Singapore safeguard its long-term economic performance.

One way Singapore can sustain economic growth amid a more fragmented global economy is by deepening human capital development through initiatives like SkillsFuture and sector-specific upskilling programmes, particularly in growth sectors such as advanced manufacturing, fintech, and green technologies. Enhancing the quality of the workforce increases labour productivity, which raises AS, as the economy's productive capacity improves, represented by the outward shift of the vertical segment of the AS curve. Assuming productivity improvements exceed the percentage rise in wages, the unit cost of production falls, and the AS increase is also represented by a downward shift of the horizontal segment of the curve. Thus, AS rises from AS to AS' as shown in Figure 6.3 below. With the fall in GPL, households are able to afford more goods and services due to wealth/ real balance, international substitution and interest rate effect. For example, as GPL falls, the purchasing power (real value) of money increases, consumers perceive themselves to be wealthier, leading to higher consumption as represented by the movement along the AD curve.

There is actual growth with real GDP increasing from Y to Y'. There is likewise potential growth with the rise of the full employment level of income from Yf to Yf'. The fall in GPL from P to P' also safeguards Singapore's economic performance in the face of rising import costs due to increasing global protectionism on supply chains.

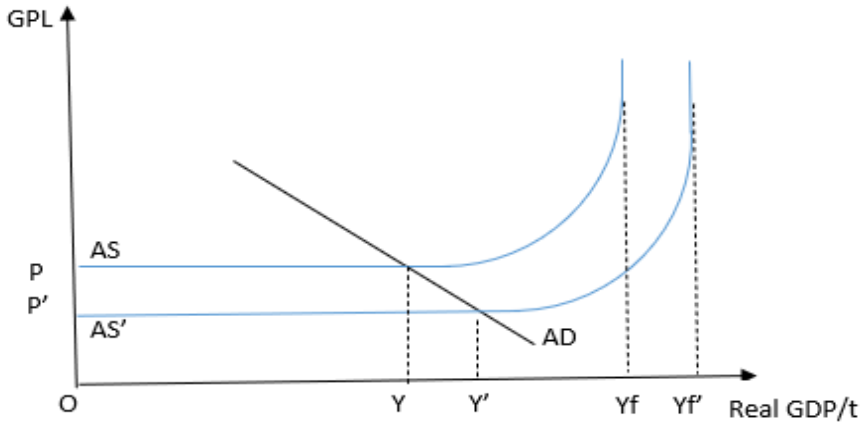


Figure 6.3

[Ev] The impact of deepening human capital development might be insufficient to compensate for reduced external demand due to Singapore's small domestic market if trade flows are sharply limited. Furthermore, human capital development takes time to yield productivity gains, and if skills training is misaligned with industry needs, as in the case of SkillsFuture where much autonomy is given to workers, the resultant impact on economic growth will be muted.

Another approach is to expand Singapore's external trade network via new or deeper trade agreements.

One example of this is Singapore's participation in the Regional Comprehensive Economic Partnership (RCEP). In a climate of global trade tensions, diversifying and strengthening trade links with multiple partners reduces overreliance on any single market and helps Singapore tap into alternative sources of demand. This sustains and improves net export revenue, a major component of AD in Singapore's open economy, due to the relatively small increase in import expenditure by the domestic market versus the large increase in export revenue given access to bigger external markets. Over time, improved market access encourages investment (I) in export-oriented industries. The rise in (X-M) and I contribute to AD increasing from AD_1 to AD_2 (Figure 6.4).

Firms face an unplanned fall in inventories and will hire more factors of production such as labour to increase production. Assuming that there is spare capacity in the economy, this will lead to an increase in the real national income from Y_1 to Y_2. This increase in national income increases the purchasing power of households, which leads to an increase in consumption of domestically produced goods and services. Part of the increase in income will also be saved, taxed and spent on imports. AD continues to increase from AD_2 to AD_3 from the increase in consumption, which causes further unplanned falls in inventories. Firms again hire more factors of production to increase production which leads to further increases in national income from Y_2 to Y_3. AD continues to increase as each round of spending creates further increases in income. This process results in a multiplied increase in real national income and will continue until the initial increase in investment expenditure (injections) equals the increase in withdrawals due to increased savings, taxes and imports.

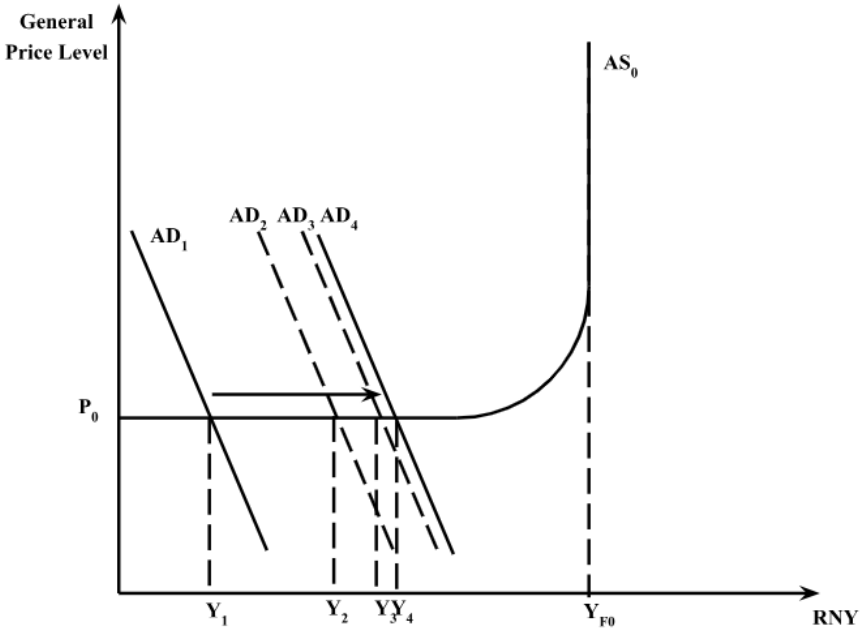


Figure 6.4

The increase in real national income from Y_1 to Y_4 reflects actual growth in the economy. The rise in I boosts capital accumulation, raising AS and can also contribute to potential growth in the long run as analysed earlier.

[Ev] The effectiveness of this policy hinges on partner economies' stability and willingness to engage in open trade with mounting protectionist sentiments. In the case of regional trade agreements, they are likely to be effective due to strong relations between the ASEAN members and the importance of acting as a bloc in international negotiations. This however might not be so for agreements with other countries considering Singapore's size relative to theirs.

Conclusion

While both policies support Singapore's long-term economic performance, her small and open economy means deepening human capital is more effective and takes priority.

It provides a more resilient, domestically anchored driver of long-term growth, maintaining export competitiveness in the face of rising tariffs, since Singapore's small domestic market means that she will continue to remain export dependent for her growth. In contrast, expanding trade networks can boost AD more quickly but opportunities might be more limited in the face of the growing backlash against globalisation. Hence, in a fragmented global economy, human capital development is more effective and should take precedence, with trade agreements playing a complementary short-run role.

Mark Scheme

Level	Descriptor	Marks
L3	Developed explanations of how both policies help Singapore safeguard its long-term economic performance.	8 – 10
L2	Under-developed explanations of both policies. OR Developed explanation fulfilling only one question requirement or accounting for one aspect of economic growth and/or other macro goals.	5 – 7
L1	Demonstration of some knowledge of either or both policies. Serious conceptual errors may be present.	1 – 4
Evaluation		
E3	For an answer that provides supported evaluative statements on the relative effectiveness of both policies, and arrives at an analytically well-reasoned and synthesised judgement with reference to the context.	5
E2	For an answer that makes some attempt at evaluating the relative effectiveness of both policies, but evaluative comments may be limited in scope, or not fully elaborated upon.	3 – 4
E1	For an answer that gives superficial evaluative statement(s) without supporting analysis and elaboration.	1 – 2