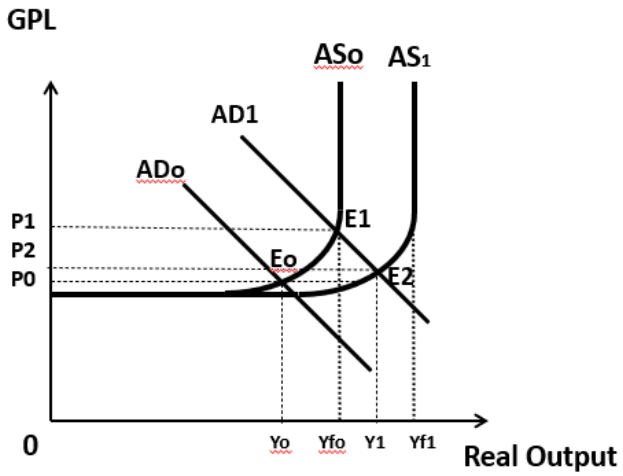
Question 2: Economic Impact of an ageing population

(a)	**With reference to Extract 5:**	
	(i)	**calculate and compare the old-age dependency ratio for Singapore in 1990 with that in 2020. [3]**
		Old-age dependency ratio = Residents aged 65 years and over per 100 residents aged 20-64 years **<u>Calculation</u>** Old-age dependency ratio (1990) = $164000 \div 17200 \approx 10$ **(1m)** Old-age dependency ratio (2020) = $614000 \div 26260 \approx 23$ **(1m)** **<u>Compare</u>** Old-age dependency ratio in 2020 is 2.3 times **(1m)** that of 1990's.
	(ii)	**explain <u>one</u> reason for the change in the old-age dependency ratio for Singapore between 1990 and 2020. [2]**
		<u>Note</u>: Since old-age dependency ratio is the ratio of residents aged 65 years and over to per 100 residents aged 20-64 years. An increase in old-age dependency ratio could be due to (1) increase in number of residents aged 65 years and over and/or (2) decrease in residents aged 20-64 years. From Extract 5, a possible reason could be the ageing population **(1m)** in Singapore which has resulted in the significant increase in the number of elderly aged 65 years and over. This increase in ageing population is likely to be at a higher rate than labour force since there is slower labour force growth which implies that the number of residents aged 20-64 years is increasing at a decreasing rate **(1m).**
(b)	**Explain how the changes in the populations of countries shown in Figure 3 might affect aggregate supply and aggregate demand in those countries. [4]**	
	In Figure 3, it is projected that populations will decline in these countries. The decline in population may cause AD and AS in these countries to fall. A declining population would mean lesser number of domestic consumers and a larger proportion of elderly as compared to the young. Elderly consumers would be more cautious in their spending, as they expect incomes to fall drastically as they near retirement age, or those who are retired and no longer earning an income cut back on expenditure for expected rise in future health expenses. This, coupled with the overall fall in number of consumers would cause consumption expenditure to fall. Since AD=C+I+G+(X-M), AD falls, ceteris paribus.	

	The decline in population would result in a smaller & older working population which can cause wages to rise and productivity to fall which would increase the costs of production as well as reduce the productive capacity of the economy. This would cause the AS of the country to fall i.e. a shift of the AS curve to the left. 2m: Explain fall in AD 2m: Explain fall in AS
(c)	**With reference to Extract 5, explain why firms may choose 'to cut investment in the domestic economy substantially, even as interest rates fall'. [3]**
	A fall in interest rates will reduce the cost of borrowing which will incentivise firms to increase investment as previously unprofitable projects become profitable. **(1m)** However, an ageing population could suggest lower spending as lesser people are in the workforce while more retire and earn zero income. Thus, if firms think that "output and consumption growth will slow in response to an ageing population", firms may expect the demand for the goods and services to rise slightly or even decrease, resulting in lower revenue and ceteris paribus, lower profits. **(1m)** Hence, despite the fall in interest rates, firms may choose to cut investment substantially if "firms become pessimistic", and the fall in expected returns to investment due to slowing demand is deemed to outweigh the rise in profitability due to lowering of interest rates. **(1m)**
(d)	**Discuss whether the benefits to an economy of having an ageing population outweigh the costs. [8]**
	Introduction: An ageing population can bring about both benefits and costs to an economy. **<u>Requirement 1:</u> Benefits to an economy of having an ageing population** **<u>Rise in AD leading to actual growth</u>** It is stated in Extract 7 that "an economy with an ageing population can benefit from an accumulation of wealth and savings". Having savings, the older individuals can draw upon it to finance their spending on areas such as healthcare and education i.e. consumption increases, and this will cause a rise in AD, ceteris paribus. Assume an economy is operating with limited spare capacity, the rise in AD will shift AD0 outwards as shown in Figure 1 below.

Figure 1:



This results in a shortage of real output as total spending exceeds total output. This leads to a fall in inventories and producers will increase output to meet demand. Thus, firms will hire more factors of production. The initial rise in AD will cause further increases in output, income and consumption because one's spending becomes another's income. This is because the rise in income arising from the initial rise in AD causes a rise in income-induced consumption that results in a further increase in AD.

A new equilibrium is reached at E1 where AD1 = AS0. GPL increases to P1 while real output increases by a limited multiplied amount from Y0 to Yf0 as limited spare capacity is present. Real output increases from Y0 to Yf0 and the economy enjoys actual growth.

Rise in AS leading to sustained growth

Extract 5 also suggests that an ageing population can bring more capital per worker leading to rising productivity.

As labour force growth slows and firms face a shortage of workers, they may have to turn to machinery and automation to sustain their production. Hence, there could be higher capital to worker ratio and thus higher productivity. The increase in quantity of capital and quality of resources would increase the productive capacity, causing AS to shift to the right from AS0 to AS1 as shown in Figure 1.

When AS increase from AS0 to AS1, potential growth occurs as shown by an increase from Yf0 to Yf1. There is also a further rise in real output from Yf0 to

Y1 and fall in GPL from P2 to P3. The economy can enjoy sustained growth i.e. non-inflationary growth.

Requirement 2: Costs to an economy of having an ageing population

However, an economy having an ageing population faces costs as well.

Firstly, as stated in Extract 5, with an ageing population there will be a strain on a government's budget as the government will increase its spending on transfer payments "in the form of pensions, health care, and long-term care" as populations age.

When the government spending exceeds its revenue, the government will incur a budget deficit. If the government is unable to finance the increase in spending on transfer payments by current taxes or drawing from its past savings or reserves, the government may have to resort to raising tax rates on income.

Fall in AD leading to negative growth

Raising personal income tax would decrease the disposable income of working adults and lower purchasing power. Assuming normal goods, there would be a fall in consumption expenditure. In addition, raising corporate income tax would lower the post-tax profits. The fall in expected returns from investment would discourage firms from investing, causing investment expenditure to fall. AD falls, ceteris paribus. Assuming the economy was operating with limited spare capacity, the fall in AD would lead to multiplied fall in real output, causing negative economic growth.

Fall in AS leading to inflation

In addition, raising personal income tax could lead to disincentive effects on work due to fall in opportunity cost of leisure. Productivity of workers decrease and quality of labour decreases. In addition, the fall in investment expenditure could slow down the rate of capital accumulation. This could cause quantity of capital to decrease over time. As a result, there is fall in productive capacity and decrease in LRAS. This reduces the potential output of the economy, and if AD is sufficiently high, the fall in AS could lead to further negative economic growth and a rise in GPL, causing inflationary pressures.

Should the government resort to borrowing to finance its increasing and persistent expenditure as its population ages, it can lead to a persistent and large national debt. It will not only face high cost of servicing the debt (interest payments) but may have its credit rating reduced especially when the national debt is a high % of its GDP. This will lead to a weaker investment climate as investors' confidence in the country fall and possibly reduce foreign direct investment in the county and hence result in slower economic growth.

Conclusion:
Whether the benefits outweigh the costs of an ageing population is dependent on the **[Criterion]** government policies put in place to minimise the costs and maximise the benefits.

While old-age dependency ratio increases for countries with ageing population, the actual pressure on working adults decreases as proportion of consumption financed by the elderly themselves increases. For instance, in countries like US and SG, people may retire later and are more self-reliant in their old age. In SG, the government puts in place schemes such as CPF LIFE that can provide coverage for the retirement income needs of its people financed through compulsory savings. **[Opinion]** Hence, the costs of an ageing population may not be as significant in such countries, and in fact, could be more beneficial as the elderly seeks to remain productive and employable to finance their own expenses. However, for countries such as many in Europe, the heavy reliance on the public sector transfer payments is likely to result in higher costs for the working adults as taxes are likely to be raised to finance such government expenses.

Mark Scheme:

Level	Descriptors
2 (4 – 6 marks)	• Explain **both** benefits and costs to an economy of having an ageing population. • Well-developed economic analysis and appropriate use of case materials to support explanation.
1 (1 – 3 marks)	• Explain **only** benefits **or** costs to an economy of having an ageing population. • Lack economic analysis and use of relevant case materials to support explanation.
Evaluation (1 – 2 marks)	Well-reasoned conclusion about whether there are more benefits than costs to an economy of having an ageing population.

(e) **Discuss whether immigration is the best way of promoting economic growth in an economy with an ageing population. [10]**

Introduction:
Immigration refers to the influx of migrant workers into domestic countries, i.e., economies with ageing population such as UK, Japan and US.

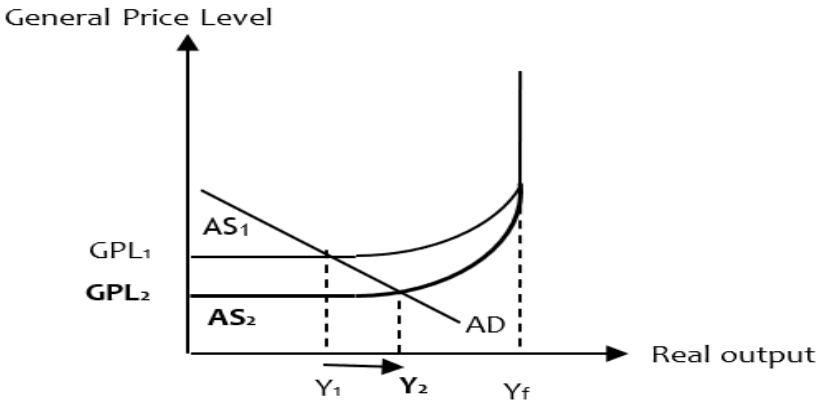
Requirement 1: Immigration promotes economic growth in economy with ageing population

a) Promotes actual growth

As stated in Extract 8 para 1, many high-income economies such as US, UK and Japan are experiencing labour shortages due to ageing population. The 'tightness in the labour market' lead to wage rates rises. (*Assuming wage rates increase faster than the productivity growth, then unit cost of production will increase which reduces the potential profit per unit and hence a fall in SRAS (horizontal portion of AS). Assuming AD remains unchanged, the fall in SRAS will lead to a fall in real output, ceteris paribus. This would result in* ***negative growth*** *for these economies with ageing population.)*

[Explain how immigration helps achieve EG] Immigration helps to increase the labour supply in these economies which in turn brings down the unit COP which causes the potential profit per unit to rise and hence a rise in individual supply. If sufficient supply curves shifts, AS will rise and shift rightwards from AS_1 to AS_2 as seen in Figure 2 below. Assuming AD remains unchanged, the rise in AS will result in a rise in real output from Y_1 to Y_2, ceteris paribus. This would result in **actual growth** for these economies with ageing population.

Figure 2:



As real output increases, it will gradually lead to a rise in C and I given the boost in household and business confidence, which in turn leads to a rise in AD, ceteris paribus. Assuming the economy is operating with limited spare capacity, the rise in AD will result in multiple increase in production, output and national income via the dampened multiplier effect. This would therefore allow economies with ageing population to experience **actual growth**.

b) Promotes potential & sustained growth

As stated in Extract 8 para 2, countries facing labour shortages due to ageing population would experience a "reduction in potential output by as much as 3% by 2050". ***[Explain how immigration helps achieve PG]*** In

the long run, immigration increases labour supply which increases the quantity of labour which in turn increases the AS, shifting the AS curve to the right from AS1 to AS2 as shown in Figure 2 below. This would lead to **potential growth** as shown by an increase from Yf1 to Yf2. *Assuming that there is high enough AD*, real output will increase further from Y1 to Y2 and GPL fell from P1 to P2. The economy can enjoy **sustained growth** i.e. non-inflationary growth.

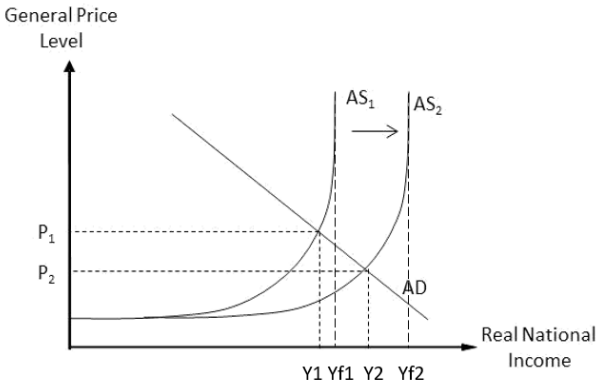


Figure 2

How well it works:

(-) Immigration could result in lower productivity as the economy becomes over-reliant on low skilled foreign workers. As labour becomes more readily available due to influx of foreign labour, firms may not have the incentive to improve productivity, for example through skills training or automation. As such, there would be low productivity growth and the LRAS would remain stagnant.

<u>Requirement 2:</u> Other policies such as Skillsfuture can promote economic growth

A. Alternative policy to promote economic growth

The government could "invest in life-long learning initiatives" such as SkillsFuture as a way to "invest in their human capital" as mentioned in Extract 7 para 1 and 2. Successful education and training programmes could boost the country's human capital potential and this could raise their productivity, enabling the elderly workers to continue to remain in the workforce beyond retirement age. With increased productivity level, output per man hour worked would increase, lowering the unit labour cost, hence unit cost of production decreases which increases the AS, as seen in Figure 1 above. This in turn would allow the economies to achieve **actual growth**. At the same time, there would be increase in both the quantity and quality of labour and with that it can increase the AS shifting the AS curve to the right from AS1 to AS2 as shown in Figure 2 above. This would allow the economies to achieve **sustained economic growth**.

	(Note: harnessing the advancement in technology to increase productivity as seen in Extract 5, and hence economic growth can also be accepted) **Conclusion:** **[Criterion: Root Cause of the problem]** Immigration alone may not be the best way of promoting economic growth in an economy with ageing population, as it does not address some of the key problems that hinders growth. Ageing population could lead to lower productivity and higher government expenses on transfer payments and healthcare etc. While immigration can help to increase the quantity of resources, it also causes AD to rise with rising consumption expenditure, hence, if AS does not increase fast enough, it could still lead to inflation. Hence, long run supply-side policies such as education and training programmes would still be crucial to directly tackle the slowdown in productivity associated with ageing population. By doing so, it also ensures the employability and relevance of the skillsets of the elderly, thus they are able to continue working and finance their own consumption expenditure. This would thus help to reduce the government expenditure, which could in turn reduce the need for higher taxes that could potentially affect the AS (explained in d). **OR** **[Criterion: Nature of Economy]** Immigration can help to alleviate the challenges associated with a shrinking and ageing population, but should only be used in the short run to achieve economic growth. For in the long run, over dependence on foreign labour could lead to other social problems and is not a sustainable approach. This is especially true for countries like Singapore where space and resources are already limited. Perhaps, governments could keep immigration open to high-skilled foreign labour to ensure long term productivity growth and restrict immigration to low-skilled foreign labour to keep the inflow of labour at a more sustainable rate.

Mark Scheme:

Level	Descriptors
2 (4 – 7 marks)	• Explain how **economic growth can and cannot be achieved** through immigration for economies facing ageing population. • Well-developed economic analysis and appropriate use of case materials to support explanation.
1 (1 – 3 marks)	• Explain **only** how immigration can **or** cannot achieve economic growth through immigration for economies facing ageing population. • Lack economic analysis and use of relevant case materials to support explanation.
Evaluation (1 – 3 marks)	Well-reasoned conclusion about whether immigration is the best way for economies facing ageing population to achieve economic growth.

[Total: 30]