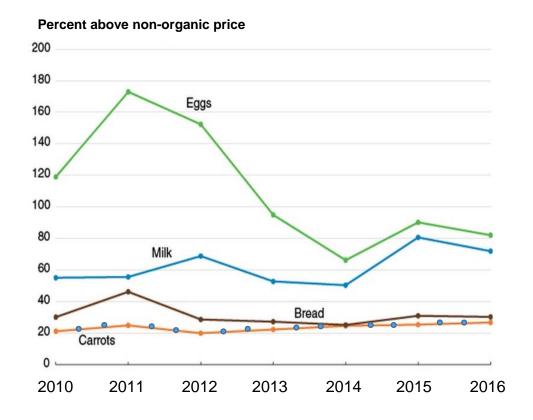
Question 1: Healthy Eating

Extract 1: The shifting economics of organic food

Anyone who's set foot in a supermarket or farmers' market in the past decade has noticed that organic food is considerably pricier than conventional food. But this "organic premium" — the difference between the two — can vary widely from product to product. And in some cases, the gap is actually shrinking quite dramatically.

So what's going on here? Start with the fact that any food certified as "organic" has to meet certain standards laid out by the United States Department of Agriculture (USDA). Organic farms are prohibited from using synthetic pesticides, petroleum-based fertilizers, bio solids fertilizer (made from sewage sludge), irradiation, preservatives and genetic engineering. Processed food has to go through certified organic plants though organic canned processed food are not required to omit preservatives. In addition, any animal products labelled organic have to come from animals that were fed organic feed and never given antibiotics or growth hormones. In practice, these rules can encompass a wide variety of farmers and methods. But by and large, the restrictions tend to increase costs and delay production. The difference in price tends to be lowest for things like spinach or apples.

Figure 1: Percent above non-organic price of selected organic food



Source: USDA, Economic Research Service 2016 Nielsen Homescan data

The difference in price is higher for processed food like organic canned spinach, and highest for animal products. What's really interesting, though, is how this premium is changing over time. Some organic products are getting cheaper. Others, not so much. For crops like spinach or coffee, the organic option typically costs more because farmers have to spend more on weed and pest control. But as a 2012 paper from the National Sustainable Agriculture Information Service explains, this situation has changed over time. Early on, organic produce farmers simply paid more for non-synthetic herbicides and insecticides. More recently, many organic farmers have been switching practices — harnessing techniques like integrated pest management and making better use of insect predators.

For milk or eggs to be certified as organic, farmers have to use feed for their animals (like corn and soy) that's grown organically. Organic feed has often been in short supply (particularly in recent years, as it's been far more lucrative for farmers to grow conventional feed).

Source: Vox, June 2016

Extract 2: Is organic food healthier?

Singapore Nutrition and Dietetics Association (SNDA) accredited dietitian Jaclyn Reutens said: "Organic food has become so popular because they claim that no pesticides, hormones and fertilisers are used. It sounds great because nobody would want to consume these chemicals."

Mrs Celeste Viviers, a registered dietitian and owner of nutrition and wellness consultancy Nutrilicious, said that there is little research to show that the nutritional value of organic food is significantly higher than regular food. "It is not proven that organic food is more nutritious than conventional food even though there are less pesticides and chemicals," she said. Mrs Viviers believes that the Internet and increase in spending power of Singaporeans are one of the reasons behind the increase in demand for organic food.

If organic food is really healthier as retailers and producers claim it to be, does it mean that only the rich in Singapore can afford the healthier lifestyle?

Adapted from The Straits Times, February 2016

Extract 3: Subsidies for diabetes screening

Ministry of Health, Singapore (MOH) and Health Promotion Board, Singapore (HPB) earlier announced the launch of the Diabetes Risk Assessment (DRA) tool and the enhanced Screen for Life (SFL) subsidies on 1 September 2017.

There is a need for early detection and appropriate intervention to prevent or delay the onset of diabetes and related complications. This would also help Singaporeans to realise the consequences of their diet which is becoming unhealthier over the years mainly due to high sugar content and unhealthy fats. Under the enhanced SFL screening, all eligible Singaporeans can go for recommended screening such as for

diabetes, and follow up at Community Health Assist Scheme (CHAS) GP clinics. They will pay a small fixed fee of \$5 or less for their screening test and first post-screening follow up consultation. CHAS cardholders will pay \$2, and Pioneers (Singaporeans born before 1950) will not need to pay. HPB will be sending out invitation letters progressively, to notify Singaporeans of their eligibility.

Source: Ministry of Health, Singapore, 2017

Extract 4: Gearing up for the fight against diabetes

Imagine a Singapore where there is drinking water wherever you go - whether it is at a park connector or shopping centre - and you pay a sugar tax on your packaged drinks. That is what might happen as Health Minister Gan Kim Yong ramps up the war against diabetes. He wants to saturate the country with readily available drinking water to wean people off sweetened drinks. About 100 million cans of sweetened soda are sold here every month. Sugar, whether in drinks or food, raises the risks of obesity, heart disease and type 2 diabetes.

From this month, water must be provided at all government and People's Association functions. "In the past, it was always syrup or coffee or tea," he said. "If I ask for water, I get a bottled drink." He wants water to be made freely available in public areas and is working with the National Environment Agency, which oversees hawker centres, and the National Parks Board about providing more drinking points. "Making water widely available is very important in our efforts. Over time it'll become the norm. And then it becomes a mindset that healthier living is the normal way we live," he said.

Also on the cards is a possible sugar tax on packaged drinks, restricting advertising of such drinks, and prominent labelling of sugar or nutritional content, Mr Gan said in an exclusive interview. But these measures hinge on whether there is support for them on the ground. Mr Gan plans to hold public consultations on what more can be done to make Singaporeans adopt healthier lifestyles.

For a developed country, Singapore has a very high prevalence of diabetes. The disease costs the country more than \$1 billion a year today. This price tag could soar to \$2.5 billion a year by 2050 if nothing is done, as a million people here would be struggling with the disease. The "war on diabetes" that Mr Gan declared two years ago has yielded some promising results so far, he said. "Singaporeans are becoming more health-conscious."

Source: The Straits Times, June 2018

Questions

(a) Using Figure 1, compare the difference in price of organic and non-organic eggs with that of milk.

[2]

Similarity: Both prices of organic eggs and organic milk is higher than the price of its non-organic variant.

Difference: The difference in price of organic and non-organic egg is becoming narrower whereas the difference in price of organic and non-organic milk is becoming wider.

(b) (i) Based on the data available, analyse and comment that changes in the cost of production were the main factor influencing changes in price of organic food.

[5]

Establishing the hypothesis:

Changes in cost of production as cited in the extract were related to use of alternative practices and techniques. This will lead to a fall in unit cost of production, and holding the price of the organic produce constant, a lower unit cost of production would result in a higher potential profit. Hence, at each possible price more units will be supplied.

This increase in supply will lead to a fall in the price of the organic produce.

Data affirming the hypothesis:

Assuming that the price of non-organic produce is constant, figure 1 shows that the gap between the prices of organic eggs and organic bread with its non-organic variant becoming smaller over the period, suggesting that there is a fall in price

Also in Figure 1, it can be seen that there has been an overall increase in the gap between the organic eggs and organic milk with its non-organic variant between 2014 to 2016. This increment could be due to increase cost of production as for milk or eggs to be certified as organic, farmers have to use feed for their animals (like corn and soy) that's grown organically. Organic feed has often been in short supply (particularly in recent years, as it's been far more lucrative for farmers to grow conventional feed). This pushes up the cost of production.

Data suggesting otherwise:

Price difference for organic carrots and organic milk as compared to its non-organic variants has been increasing over the period while the price difference between organic bread and non-organic bread did not change much overall, this is in spite of the changes in cost of production.

Variables that could have interfered with the hypothesis:

Extract 2 also suggest that the higher prices from organic produce could be due to higher demand due to taste and preference towards food sources with no chemical and pesticides, which is further enhanced by the increase spending power of consumers possibly due to increase in real income.

The data presented in Figure 1 is not conclusive of the actual price of the organic produce, the difference could be due to a change in the price of the non-organic variant itself. Such changes to the prices of its non-organic variant could be due factors that have different impact on the organic produce market, e.g. price of pesticides which are not permitted in organic farming.

Synthesis:

While cost of production is a factor behind prices through affecting supply, other factors through demand also play a part in determining market prices. Whether it is the main factor would be dependent on the extend of the change in cost of production measured against other triggers. It would be important to access these other data to make a more conclusive comment.

(ii) With reference to the concept of price elasticity of demand, explain how changes in cost of production will impact the total revenue of organic produce farmers.

[3]

Changes in cost of production as mentioned in the extract 1 for organic produce has been generally falling, leading to an increase in supply of organic produce. This would lead to a fall in price of organic produce, ceteris paribus.

Option1:

As organic produce is generally easily substituted by its nonorganic variant, the demand for organic produce would be price elastic.

Thus given a fall in price, this would lead to a more than proportionate increase in quantity demanded.

The revenue gained from the increase in quantity will thus offset the fall in revenue loss from the fall in price, leading to an overall increase in total revenue for organic produce farmers.

Option 2:

As the market for organic produce caters to those who are health conscious, it might mean that for this group of consumers, they see little or no alternative to organic produce in order to live a certain lifestyle. Therefore, the demand for organic produce would be relatively price inelastic.

Thus given a fall in price, this would lead to a less than proportionate increase in quantity demanded.

The revenue loss from the fall in price will thus offset the gain in revenue from the increase in quantity, leading to an overall decrease in total revenue for organic produce farmers.

- **(c)** With reference to Extract 1, account for the difference in price elasticity of supply between:
 - (i) organic canned spinach and organic spinach,

[2]

The supply of organic canned spinach is relatively more price elastic compared to that of organic spinach.

Organic canned spinach which has preservatives added will have a longer shelf life and be allowed to be kept as stocks in warehouse as compared to organic spinach which is perishable. Thus there is more availability of stock for organic canned spinach which would translate to the a more responsive change in quantity supplied given a change in its price.

(ii) non-organic food and organic food.

[2]

The supply of non-organic food is relatively more price elastic compared to that of organic food.

As mentioned in extract 1, the restrictions placed on organic produce delay production. A lack of access to the types of fertilisers allowed and prohibition to use genetically engineer inputs will mean longer gestation periods and longer time for harvests. Thus any changes in prices of the organic produce is less likely to meet significant changes in quantity supplied as compared to that of the non-organic farms which can have faster turnaround due to its production methods.

A positive statement can be verified and tested based of facts and evidence if the claims it makes is true or false, whereas a normative statement involves value judgement and its claims are based on subjective beliefs.

Singapore Nutrition and Dietetics Association (SNDA) accredited dietitian Jaclyn Reutens said: "Organic food has become so popular because they claim that no pesticides, hormones and fertilisers are used. It sounds great because nobody would want to consume these chemicals."

Mrs Celeste Viviers, a registered dietitian and owner of nutrition and wellness consultancy Nutrilicious, said that there is little research to show that the nutritional value of organic food is significantly higher than regular food. "It is not proven that organic food is more nutritious than conventional food even though there are less pesticides and chemicals," she said. Mrs Viviers believes that the Internet and increase in spending power of Singaporeans are one of the reasons behind the increase in demand for organic food.

If organic food is really healthier as retailers and producers claim it to be, does it mean that only the rich in Singapore can afford the healthier lifestyle?

Yellow highlighted = normative economic statement Blue highlighted = positive economic statement

(e) Extract 2 suggests that only the rich in Singapore can afford the healthier lifestyle. Consider whether price controls on organic food is the best intervention against inequity in the market for organic food.

[8]

Introduction - Establish the initial equilibrium:

Prices are determined by interactions between demand and supply, a low supply due to high cost of production and high demand due to strong taste and preference and increasing income of consumers lead to a high equilibrium price.

Such a high price render organic produce affordable only to the rich and present a situation of inequity where resources are rationed only to the select group of consumers.

Thesis -

What is price control (price ceiling)

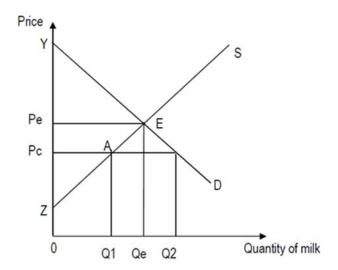
Price control in the form of price ceiling would be suitable to tackle this.

A price ceiling refers to the <u>maximum</u> price that a producer can charge for a good legally. It is the maximum legally permissible price.

How does price control works?

For it to be effective, it must be set <u>below the equilibrium price</u>. If it is set above equilibrium, the price will fall to the equilibrium price, rendering a price ceiling ineffective. If it is set below equilibrium, the price will not be permitted to rise to equilibrium price, thereby making the price ceiling effective.

With reference to the following diagram, the free market equilibrium price and quantity of milk are OPe and OQe respectively. Before the implementation of the price ceiling, the total revenue of the producers is OPeEQe. If a price ceiling of OPc is imposed on milk, the quantity demanded will rise to 0Q2 and quantity supplied will fall to 0Q1. The total revenue of the producers will fall from OPeEQe to OPcAQ1. An excess demand of Q1Q2 results. The excess demand will remain because the market is prevented from readjusting itself.



How well does price control works?

A price ceiling is used when the government considers the marketdetermined price to be too high. It thus aims to protect the buyers of the product. It is usually used to achieve a fairer distribution of essential goods and services such as staple foodstuff, transport, utilities and housing by ensuring affordability of these goods to lower income households

Anti-thesis

Unintended consequences of price ceiling

- The excess consumer demand is likely to lead to the development of black market, where some producers are tempted to sell above the price ceiling. Moreover, some consumers will be prepared to pay higher price in order to ensure their own consumption of the good. This outcome runs counter to the intention of making it easier for low-income groups to consume the good.
- Excess demand for the good implies that some method will have to be used to ration the limited supply of the product to the consumers. One way of distributing the limited supply is on a "first come first serve" basis. This will lead to queues developing and is inefficient because they waste buyers' time. The suppliers could also ration the goods according to their own personal biases, selling only to their friends and relatives. This method is inefficient because the good does not go to the buyers who value it most. In contrast, the rationing mechanism in a free market is both efficient and impersonal. When the market reaches the equilibrium, anyone who wants to pay the market price can get the good.
- Another way of allocating the product is by government rationing. Here, the government issues ration booklets to households according to their personal circumstances. The booklets contain coupons which can be exchanged for basic foodstuffs. However, rationing is likely to be extremely unpopular during peacetime and would involve high administration costs.

A better alternative to price control?

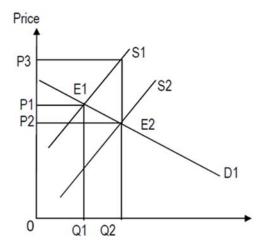
An alternative to a price ceiling would be to offer a subsidy. E.g. the government can make the price of the good more affordable by paying a fraction of the price of the good for poor families. Such subsidies can raise the living standards of the producers without causing a shortage.

Subsidies are transfers from the government to the firm for the provision of goods and services. In the case of a specific subsidy, the government grants to the producers a subsidy per unit of the good produced.

Such a subsidy lowers the unit cost of production of supplying a good to the market by the extent of the subsidy per unit. Holding the price of the good constant, a lower unit cost of production would result in a higher potential profit per unit. Hence, at each possible price more units will be supplied causing a rightward shift in the supply curve from S1 to S2 as shown in following diagram.

Effects of a Specific Subsidy

With reference to diagram, the initial equilibrium price and output are OP1 and OQ1 respectively. When a subsidy is granted on wheat, the supply curve will shift downwards by the full amount of the subsidy granted. At OP1, there will be an excess supply of wheat. This will cause the price to fall and quantity exchanged to rise. These changes will occur until a new market equilibrium is attained at E2 with a lower equilibrium price, OP2 and a higher equilibrium quantity, OQ2.



Conclusion

As seen in Extract 2, Mrs Celeste Viviers, a registered dietitian and owner of nutrition and wellness consultancy Nutrilicious, said that there is little research to show that the nutritional value of organic food is significantly higher than regular food. "It is not proven that organic food is more nutritious than conventional food even though there are less pesticides and chemicals". This suggest that perhaps there really is no need for any form of government intervention as organic food could just be a luxury item and not a keen essential which is required for improvement in quality of life.

Levels	Descriptors	Marks
L2	A well explained answer on how price ceiling works AND a well explained alternative	4-6
L1	A descriptive explanation on how price ceiling and an alternative works. A well-explained answer on how price ceiling works	1-3
Evaluation	Explained evaluation of the policies given the context of Singapore.	1-2

Commenting	on	the	validity	of	government	
intervention.						

(f) Explain why the market for sweetened drinks warrants an intervention from the Singapore government.

[7]

Introduction:

Sweetened drinks are a form of demerit goods.

Demerit goods are goods that the government believes consumers will consume too much if provided by the market because of **information failure** (under-estimation of private costs in consumption or an overestimation of the private benefits) and **negative externalities in consumption** (costs on <u>third parties</u> not considered).

1. Explaining the Divergence of the benefits curves:

Information Failure:

Private benefits in consumption of demerit good overestimated

The private costs of drinking sweetened drinks include the consumer's expenditure on the drink as well as extra health care costs due to diabetes, loss of income due to absences from work caused by diabetic related illnesses and early deaths. In the case of sweetened drinks, consumers may underestimate the private costs of sweetened drinks consumption as they may not be fully informed of the health risks of diabetes or may underestimate the chances of being affected by other diabetic-related illnesses. Because they do not fully appreciate the harmful effects (information failure) of such goods, they tend to overestimate the private benefits of sweetened drinks and hence overdemand sweetened drinks. The demand is at MPB1 (or D1) instead of MPB2 (D2).

External costs of demerit good not considered:

In addition, the consumption of demerit goods such as sweetened drinks also imposes <u>external costs</u> on third parties. The government incurs extra cost of financing health care costs of citizens who suffer from diabetic related illnesses. Employers will suffer loss in revenue due to lower productivity of workers with diabetes at work. The employers may also incur extra cost of financing health care costs of workers who suffer from diabetic related illnesses. The external cost in consumption (MEC) causes the social benefit (MSB) to be less than the private benefit (MPB2) of consumption.

The overall **divergence** between MSB and MPB1 is due to both information failure and negative externalities in consumption.

2. Explaining the 2 equilibriums

Socially Optimal Equilibrium:

To maximize society's welfare, the socially optimal level of output is at 0Q3 where MSB=MSC. At the market output 0Q1, MSC exceeds MSB and there can be an improvement in society's welfare by decreasing production and consumption of the demerit good.

Overproduction and overconsumption of demerit good:

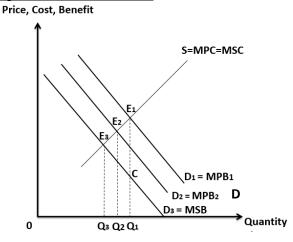
3. Allocative inefficiency:

There is, thus an overproduction and overconsumption of Q1Q3 units of the good which means that there is an overallocation of resources into the market for sweetened drinks.

4. Explain Deadweight Loss:

Total social cost from consuming Q1Q3 units of the good (Q1E1E3Q3) exceeds the total social benefit from consuming Q1Q3 units (Q1CE3Q3), leading a welfare loss of area E1E3C. This is also known as a deadweight loss. Hence, there is allocative inefficiency in the market where the right amount of the good is not produced and thus the market fails.

Figure: Demerit Goods



Conclusion:

The presence of market failure therefore warrants government intervention. This is all the more so when the extent of the market failure is likely to very large as the externalities incur by the government as seen in the extract amounts to 1 billion SGD a year with the possibility of rising to 2.5 billion SGD by 2050.

Factors to consider when reviewing the various policies

1. **Perspectives**

The Singapore government may consider multiple perspectives when making the decision to implement or review policies, for example, from the standpoint of equity in other markets or labour productivity for the economy (macro perspective). This could affect the government perception of the costs and benefits of correcting inefficiency in the market. The decision will bring about a set of **outcomes** in terms of:

Intended consequences, which include the effects that were expected, such as reduced misallocation of resources associated over consumption of sweetened drinks.

Unintended consequences, which include the consequences faced by the government, such as the increase in concerns on the ground in regards to rise in cost of living, and the consequences that impact the macro economy due to the fall in productivity of labour from diabetic related illness, or even more equity in the healthcare markets.

Effectiveness achieving objective i.e. lower a. in its consumption (Intended Consequences)

The objective of all the policy is to influence the eventual consumption level either through demand side or supply side. The nearer the new market equilibrium after intervention is to the socially optimum level of consumption, the more appropriate is the policy.

Effectiveness of the demand side policies:

As most of the above mentioned policies works through influencing the demand of sweetened drinks through education and correction of information failure, its extent of how it will lead to a fall in demand is dependent on the receptivity of the consumers.

This is in term affected by the ability of the consumer to make rational decision:

There are some assumptions underpinning the rational decision making of a consumer:

there is complete information

- consumers have the ability to conduct analysis and think through competing alternatives which are healthier
- consumers have sufficient time to arrive at a rational decision as some of these consumption patterns are habitual and require time to change

Generally speaking, given the level of literacy and education, Singaporeans are mostly rational and are receptive to correcting the information failure associated with overconsumption of sweetened drinks, this was further affirmed by the Health Minister in Extract 4.

Effectiveness of the supply side policies:

The suggested sugar tax on sweetened drinks on the contrary may not be as effective in terms of lowering consumption.

The demand for sweetened drinks is likely to be price inelastic as consumers of such drinks are likely to be habitual drinkers to such beverages and see little substitutes to it. Also the fact that these sweetened drinks form a rather insignificant portion of the consumer's income, this would mean that any increase in price due to tax is likely to see a less than proportionate fall in quantity demanded.

b. Unintended Consequences

An unintended outcome of encouraging Singaporeans to go for a diabetes check-up and through that be more aware of their information failure associated with the consumption of sweetened drinks would be in the form of more affordable healthcare services.

Subsidies provided for diabetes check-up lower the price of these checkups and provide access to the poor who may otherwise not be able to afford this merit good. This ensures greater equity. While this may not be directly link to the sweetened drinks market, equity in other markets could be of an importance perspective for the government.

Thus part of reviewing policies would include unintended consequences, both positive and negative in the market of implementation, and even in other markets.

2. Constraints: Resources such as Finances and Labour

In reviewing appropriateness of policies, an area of concern is whether there are enough resources available for the implementation of the policies.

Installation and provision of sweetened drinks alternatives in the form of drinking points can be a serious financial commitment which is not once off as resources are required for its upkeep and maintainence.

Provision of subsidies for diabetic-related illness check-up can also amount up to huge finances as Singapore's intention is to provide such healthcare services for free or maximum of a 5SGD fee.

Sugar taxes on sweetened drinks on the other hand does not add on to the burden of Singapore finances and yet at the same time generate tax revenue that could be rechannelled back to run the above mentioned policies.

Generally speaking, while Singapore may not have an issue with spending especially when we are not laden with government debt or deficit, prudence is still of important value.

While constraints discussed above are in the form of finances, resources may be in the form of requirement of labour to monitor whether enforcement such as printing of information on sweetened drinks are adhered to. In Singapore, the shortage of labour can prove to be a defining constraint. Though such a constraint is not as severe as monitoring need not be as frequent in a country where the rule of law is practiced with little or no corruption. The geographical size of Singapore also minimize the requirement of a large monitoring contigent.

3. Opportunity Costs

In similar fashion, the policies which require the most resources would incur the largest opportunity cost. As such whichever policies that require the least would be seen as appropriate. Refer to point 2.

4. Ease of implementation/ fine tuning

Another factor for consideration is the ease of implementation and fine tuning of the said policies.

For example, should there be a narrowing of gaps between actual demand and the correct demand, a policy like sugar tax can be adjusted accordingly.

Tax is considered to be a good measure for a number of reasons. This is a market-based solution and can be <u>easily implemented</u> to reduce consumption. It is flexible as the amount of <u>taxes</u> can be <u>varied</u> to reflect the external cost.

5. Data Collection

Another factor to consider is the dependence of the policies on accurate data collected.

For example, success in the use of taxes depends on the accuracy in measuring the exact value of external costs of an activity and hence deciding on the correct amount of taxes which in practice is a difficult task as they may be difficult to monetize and estimate. This makes imposing the correct amount of taxes difficult. Over-taxing and under-taxing will still lead to inefficient allocation of resources.

Usually in the context of Singapore, such data are quite accurate as data collection is relatively easier given the size of the country and also the administration involved in data collection are equipped with the knowledge and appropriate technology and process.

6. Source of the problem

An important consideration is the source of the problem, the Singapore government might be interested to tackle the root of the issue and thereby understanding whether the inefficiency is due to demand or supply might be key in selecting or streamlining its policies.

Conclusion:

The most important factor to assess the appropriateness of the various policies would be the extent to which its objectives is met, this is especially significant given the size of the externalities as predicted by the government.

Factors like constraints and data collection are relatively less significant as they are not meaningful given the circumstances in which Singapore operates in i.e. a healthy budget with surplus year on year and data accuracy given its well-trained administration.

Levels	Descriptors	Marks
L3	An answer that explain at least 2 factors in details, explaining why the government should consider these factors prior or after implementation. Cap at 7 marks for 2 well explained factors	6-9
L2	An answer that explains the various factors descriptively OR An answer that explain a factor thoroughly.	3-5

L1	Explanation of the various policies Singapore use to tackle the market of sweetened drinks	1-2
	OR	
	A vague list of the various factors that the government considers in policy review	
Evaluation	Ranking the factors with justification behind the rankings	1-3
	OR	
	Commenting on the significance of the factors given the context of Singapore	

[Total: 45]