1 Restaurant owners are now crying woes in Singapore as their profit margin has been hit hard due to rising rental and food costs. However, their most pressing issue is the lack of manpower and to make things worse, consumers are now tightening their belts due to the negative growth rate for the first quarter of the year. But not all hope is lost, with the rise of online food delivery services, restaurants owners are now partnering them in the hope of attracting more customers.

(a) Explain, using examples, the concepts of price elasticity of demand and income elasticity of demand. [10]

(b) Discuss how the combination of the above factors affect the market for different types of restaurant services in Singapore. [15]

Suggested Answers

(a) Explain, using examples, the concepts of price elasticity of demand and income elasticity of demand. [10]

Command Word: Explain

Context: No particular goods/services given. Need to provide examples.

Content: PED & YED (Definition, Sign & Magnitude)

Introduction:

- **Elasticity** is a measure used to show how *responsive* one variable is to a change in another variable.
- Explanation of PED & YED concepts will be based on definition, sign and magnitude

Body:

1: PED

- **Definition:** PED measures the responsiveness of quantity demanded of a good due to a change in its price, ceteris paribus.
- **Formula:**

$$PED = \frac{\text{Percentage Change in Quantity Demanded of Good A}}{\text{Percentage Change in Price of Good A}}$$

- **Sign: Negative**
➔ The **negative sign** of the coefficient of PED reflects the inverse relationship between price and quantity demanded (i.e. the law of demand). The law of demand states that the quantity demanded of a product is **inversely related** to its price. Hence an increase in price leads to a fall in the quantity demanded, ceteris paribus. Based on the formula for calculating PED, the negative sign is the result of quantity demanded and prices changing in opposite directions.

- **Magnitude:**

➔ The magnitude of the PED value signifies the sensitivity or responsiveness of quantity demanded due to the price change of the good. Generally the greater the responsiveness of quantity demanded due to price changes, the larger the magnitude

➔ If a price change causes a **more than proportionate** change in quantity demanded, quantity demanded is regarded as very responsive to price changes. Demand for the good is said to be **price elastic**.
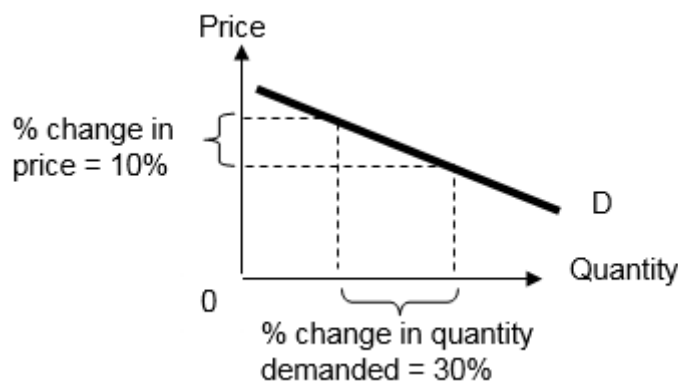

Figure 1

In Figure 1, for example, if price decreases by 10% and quantity demanded increases by 30%, the PED coefficient will be 3.

➔ If a price change results in a **less than proportionate** change in quantity demanded, quantity demanded is regarded as not very responsive to price changes. Demand for the good is said to be **price inelastic**.
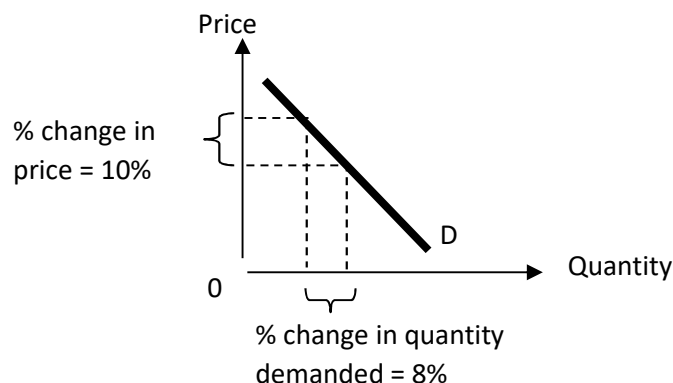

Figure 2

As illustrated in Figure 2, for example, if price decreases by 10%, and quantity demanded increases by 8%, the PED coefficient will be 0.8.

- **Factors affecting the size of Price Elasticity of Demand for a Good**
  (*pick any 1 of the factors and explain **using example***)

  (1) Number and Closeness of Substitutes in the same price range
  (2) Proportion of income consumers spent on the good
  (3) Time period
  (4) Degree of Necessity of the Good to the Consumers
  (5) Habit of the Consumers

Example:

Number and Closeness of Substitutes in the Same Price Range
How far a consumer can substitute a good for other goods depends on whether the goods concerned are good or bad substitutes. Whether the substitutes are good or bad depends on how closely related the goods are to the consumers. The more closely related the goods are, the higher the price elasticity of demand.

For example, when the price of coke increases, the quantity demanded of Coke will fall (law of demand). Consumers will then look for other carbonated drinks which are substitutes of coke such as Pepsi and Sprite. As there are many substitutes available for Coke, the demand for Coke is likely to be price elastic. Thus, when the price of Coke rises, it will lead to a more than proportionate fall in quantity demanded (PED >1). However, if the consumers deemed other carbonated drinks to be very different from Coke in terms of taste, then they are likely to deem the demand for coke to be price inelastic where the increase in price of coke will lead to a less than proportionate fall in quantity demanded.

2: YED

- **Definition:** YED measures the responsiveness of demand of a good due to a change in consumers' income, ceteris paribus.
- **Formula:**

$$YED = \frac{\text{Percentage Change in Demand of Good}}{\text{Percentage Change in Income}}$$

- **Sign: Positive (Normal Goods), Negative (Inferior Goods)**

  ➔ The sign of YED indicates whether a good is **normal** or **inferior**.
  ➔ Any good whose demand rises due to a rise in income or demand falls due to a fall in income are classified as **normal goods**. Based on the formula for calculating YED, a normal good has a *positive* income elasticity of demand because income and demand change in the *same direction*.
  ➔ Any good whose demand falls due to a rise in income or demand rises due to a fall in income are classified as **inferior goods**. Based on the formula for calculating YED, an inferior good has *negative* income elasticity of demand because income and demand change in *opposite directions*.

- **Magnitude:**
  ➔ The magnitude of the YED value signifies the sensitivity or responsiveness of demand due to income changes. Generally the greater the responsiveness of demand due to income changes, the larger the magnitude.

  ➔ YED is concerned with income changes, which is illustrated diagrammatically by a *shift of the demand curve* of the good or service. Hence the magnitude of YED provides an indication of the extent of the shift of the demand curve due to income changes.

  ➔ When Demand for a Good is Income Elastic: $1 < |YED| < $ infinity (∞)

    If an income change causes a *more than proportionate* change in the demand for a good, demand is regarded as very responsive to income changes. Demand for the good is said to be **income elastic**. These goods include luxury goods. Examples of luxury goods are meals at fine dining restaurants, cars, luxury homes. For example if a good has a $|YED| = 5$, a 1% change in income leads to a 5% change in demand for the good.

  ➔ **When Demand for a Good is Income Inelastic: $0 < |YED| < 1$**

    If income change causes a *less than proportionate* change in the demand of a good, demand is regarded as not very responsive to income changes. Demand for the good is said to be **income inelastic**. These goods include necessity goods. Examples of necessity goods are rice, salt and pepper. For example if a good has a $|YED| = 0.5$, a 1% change in income leads to a 0.5% change in demand for the good.

  Factors affecting YED *(pick any 1 of the factors and explain **_using example_**)*:

    (1) Nature of Goods
    (2) Level of Income

Example:

<u>Nature of Goods</u>

Necessities have low value of YED as its consumption is compulsory and rather stable even with changes in income. For example, when income rises, the demand for necessities such as rice will increase less than proportionately (Figure 3). On the other hand, luxury goods tend have a large YED value as people tend to want to purchase more of these goods to improve their lifestyle as their income increases. Thus, when income rises, there will be a more than proportionate rise in demand for branded goods such as Rolex and Chanel (Figure 4).
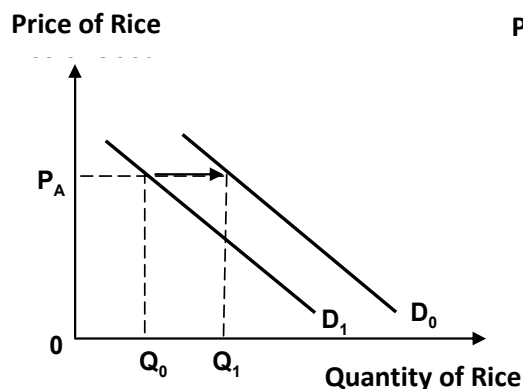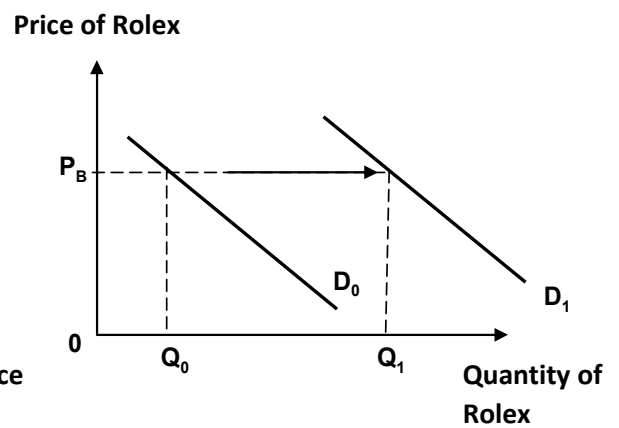

Figure 3

Figure 4

Conclusion:

- PED and YED of different products are different due to the different determinants of PED and YED.
- This analysis is based on ceteris paribus assumption but in reality, the PED and YED values may change over time.
- Different groups of consumers may also contribute to differing PED and YED for different products.

Level	Descriptor	Marks
L3	A well-developed answer that explains the definition, sign and magnitude of PED and YED using examples.	8 – 10
L2	An undeveloped answer and inadequate explanation of PED and YED.	5 - 7
L1	An answer that shows some knowledge on elasticity.	1 – 4

b) Discuss how the combination of the above factors affect the market for different types of restaurant services in Singapore. [15]

Command Word: Discuss

Context: Different types of restaurant services

Content: DD/SS analysis and elasticities of demand concepts

Introduction:

- P and Qty for restaurant service are determined by market forces of demand and supply
- Different types of restaurant services → Fine Dining, Casual Dining, Fast Food Restaurants

Body:

1. Supply Factor for all restaurants:

- Rising rental and food costs, Lack of manpower → Cost of Production will rise → Supply will fall
- This is shown in Figure 5 where the supply curve will shift to the left.
- Explain price adjustment process: At the original price, P1, there exists a shortage of Q_1 and Q_2. Consumers will thus bid for higher prices in order to get the service and producers will then react by raising quantity supplied (law of supply). Therefore, the shortage will drive up prices to P_2. Quantity will also reduced from Q_1 to Q_3.
- Supply will probably fall by a great extent for fine dining restaurants as the rental cost are much higher as compared to casual dining restaurants and fast food restaurants since they are often located in prime areas. The lack of manpower is also likely to affect the cost of production of fine dining restaurants much more than other types of restaurant services as higher wages have to be offered to attract chefs with specialised cooking skills and waiters/waitresses with experience. *(Students are to bear in mind the extent of the shifts of supply curves for the simultaneous shifts diagrams for each of the restaurant services.)*
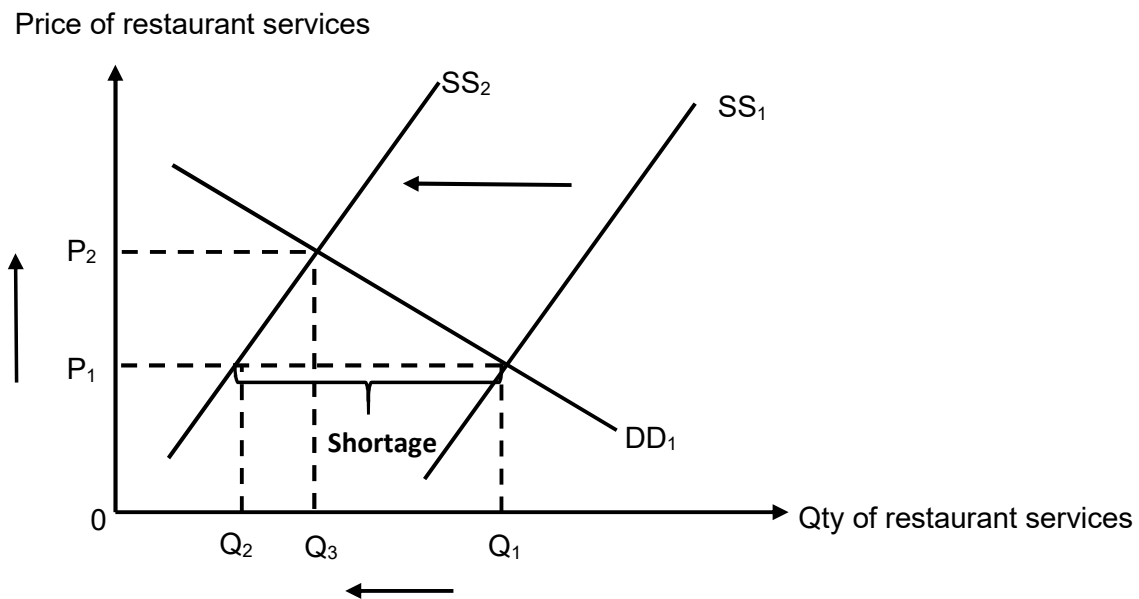
6

Price of restaurant services

Figure 5

2: Fine Dining (e.g. Waku Ghin at MBS, Iggy's at Hilton Hotel)

Demand factor:

- Fine Dining→ Luxury Service → Sign of YED is positive and greater than 1
- Negative growth rate for the first quarter of the year → Consumers' income fall → Purchasing power falls → Demand for fine dining will **fall more than proportionately** (YED > 1) [Figure 6], ceteris paribus → Both P and Qty will fall by a large extent
- Explain price adjustment process: At the original price, P1, there exists a surplus of Q_1 and Q_2. Producers will thus lower prices in order to sell off the excess and consumers will then react by increasing their quantity demanded (law of demand). Therefore, the surplus will drive down prices to P_2. Quantity will also reduce from Q_1 to Q_3.

Online delivery is unlikely to affect the demand for fine dining as fine dining focuses on the ambience and the customised services that it provides for diners.
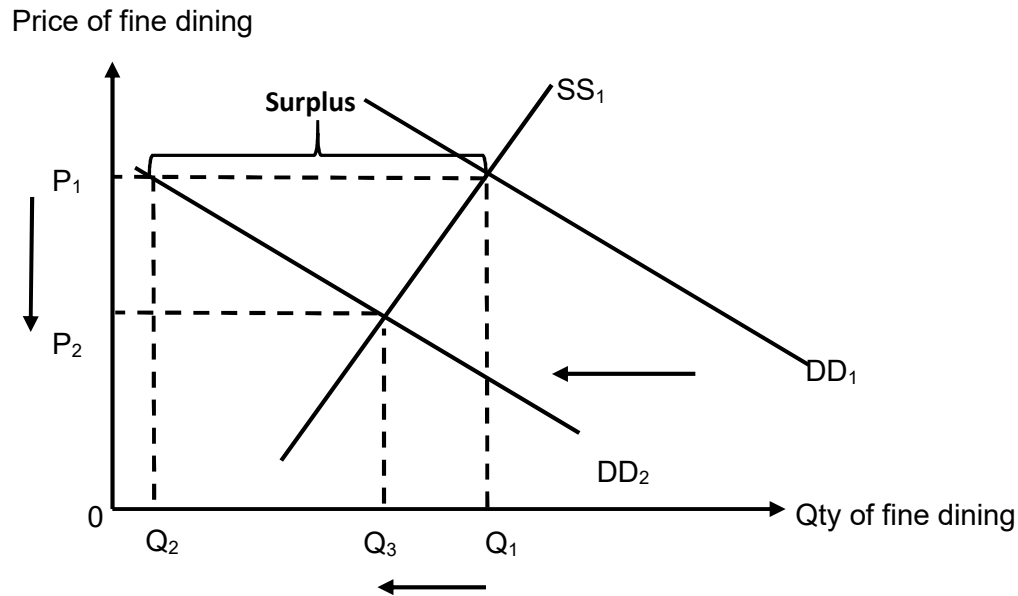
Price of fine dining

Figure 6

Supply Factor:

- As mentioned above, supply will fall by a **large extent** due to rising cost of production (Rising rental and food costs, Lack of manpower)

Simultaneous Shifts:

- With both demand and supply falling, the Qty of fine dining services provided will definitely fall but the change in price is indeterminate as it depends on the magnitude of shifts of demand and supply.
- If the magnitude of the fall in demand is larger than the magnitude of the fall in supply, then price of fine dining will fall.
- If the magnitude of the fall in demand is smaller than the magnitude of the fall in supply, then price of fine dining will fall.
- The latter might be a more probable case as the rental, food and manpower costs of fine dining contributes the most to the cost of running a fine dining restaurant. Thus, price of fine dining is going to rise (due to a shortage) and the quantity will fall. [Figure 7]
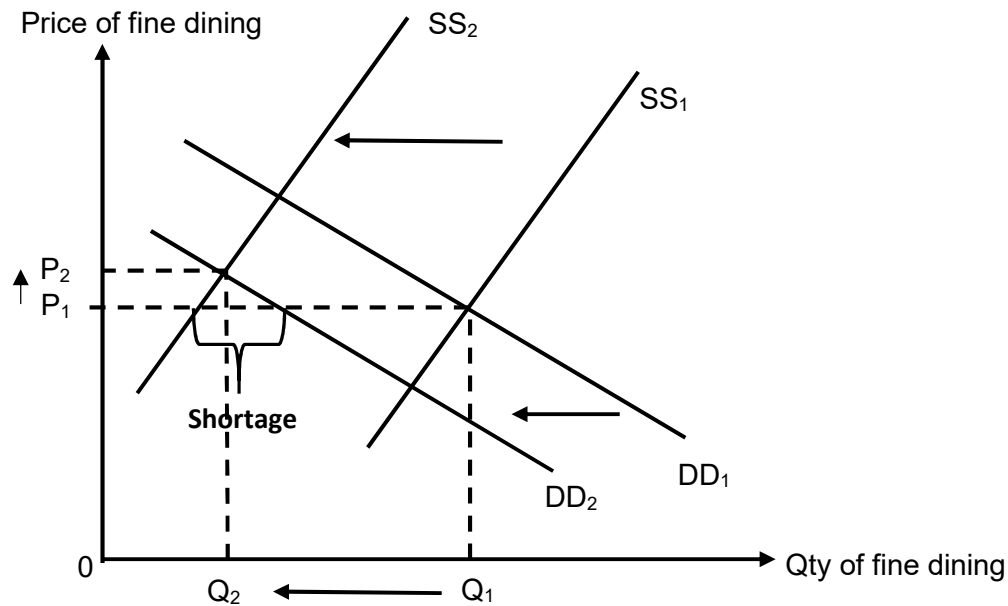
Price of fine dining

Figure 7

3: Casual Dining (E.g. Pasta Mania, Swensons)

Demand factor:

- Casual Dining → Normal good→ YED is more likely to be close to 1 but not a luxury good as compared to fine dining
- Negative growth rate for the first quarter of the year → Consumers' income fall → Purchasing power falls → Demand for casual dining will fall less than proportionately (YED is positive but less than 1), ceteris paribus → Both P and Qty will fall (due to surplus)
- However, if ceteris paribus condition does not hold, the demand for casual dining may not necessary fall. This is because when the price of fine dining increases, consumers may look for cheaper alternatives such as casual dining. Hence, the demand for casual dining may rise instead. Using the concept of XED where it measures the responsiveness of demand of good A (casual dining) to the price of good B (fine dining), ceteris paribus, the demand for casual dining may rise by a small extent if consumers find that they are weak substitutes.
- In addition, with these casual dining restaurants partnering the online food delivery services, the demand for casual dining may increase as consumers may prefer the convenience offered by casual dining.
- Thus, the overall impact on demand for casual dining is likely to rise which will result in both P and Qty to rise (due to shortage). [Figure 8]
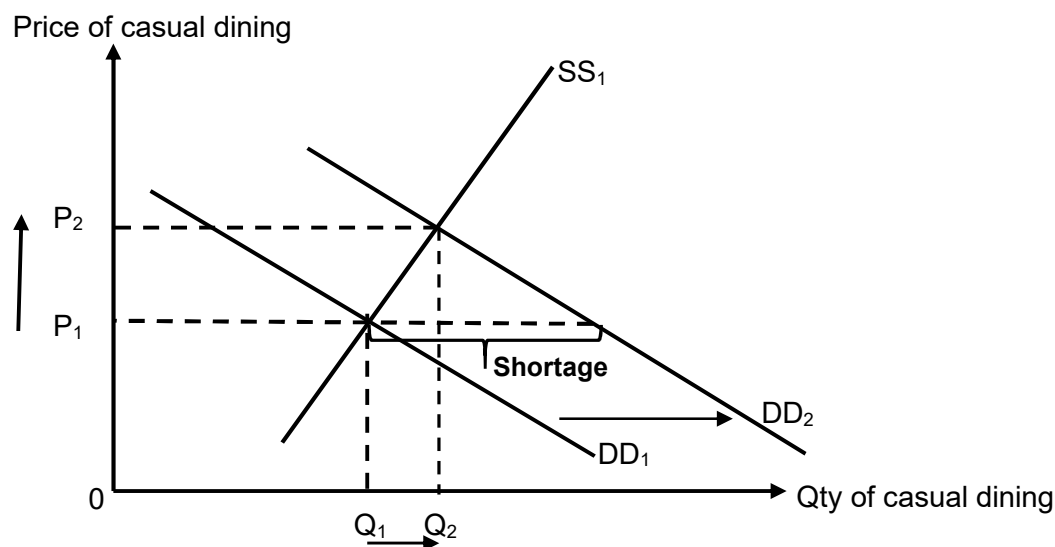
Figure 8

Supply Factor:

- Rising rental and food costs, Lack of manpower → Cost of Production will rise → SS will fall (the extent of the fall in supply will be lesser than that of fine dining)

Simultaneous Shifts:

- With the demand for casual dining likely to rise and the supply to fall, the price is definitely going to rise and the quantity is indeterminate.
- If the magnitude of the rise in demand is larger than the magnitude of the fall in supply, then quantity of casual dining will rise.
- If the magnitude of the rise in demand is smaller than the magnitude of the fall in supply, then quantity of casual dining will fall.
- Given that casual dining is a form of normal good as well, the demand is unlikely going to rise by a large extent as some consumers will still reduce their demand for it when their income falls. Thus, the rise in demand would be smaller than the fall in supply resulting in a rise in price and fall in quantity (due to shortage). [Figure 9]
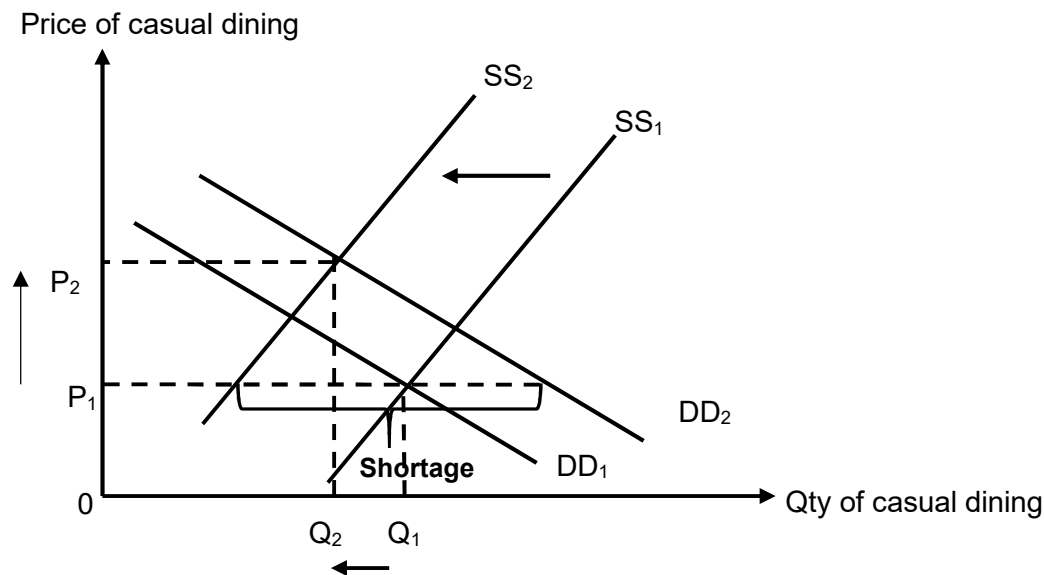
Price of casual dining

SS₂

SS₁

P₂

P₁

DD₂

Shortage

DD₁

0

Qty of casual dining

Q₂   Q₁

Figure 9

4: Fast food restaurants (MacDonald's, KFC etc)

Demand factor:

- Fast food restaurants → Inferior good→ YED is negative
- Negative growth rate for the first quarter of the year → Consumers' income fall → Purchasing power falls → Demand for fast food will rise, ceteris paribus → Both P and Qty will rise (due to shortage) [Figure 10]

Supply Factor:

- Rising rental and food costs, Lack of manpower → Cost of Production will rise → SS will fall (extent of the fall in supply will probably be lesser than that of fine dining and casual dining)

Simultaneous Shifts:

- With the demand for fast food rising and the supply falling, the price is definitely going to rise and the quantity is indeterminate.
- If the magnitude of the rise in demand is larger than the magnitude of the fall in supply, then quantity of fast food will rise.
- If the magnitude of the rise in demand is smaller than the magnitude of the fall in supply, then quantity of fast food restaurants will fall.
- As these fast food restaurants such as MacDonald's and KFC have their own delivery services as well and that their prices are relatively lower than that of casual dining, the demand for fast food are likely to rise by a larger extent than the fall in supply. Therefore, this will result in a rise in both price and quantity (due to shortage). [Figure 10]
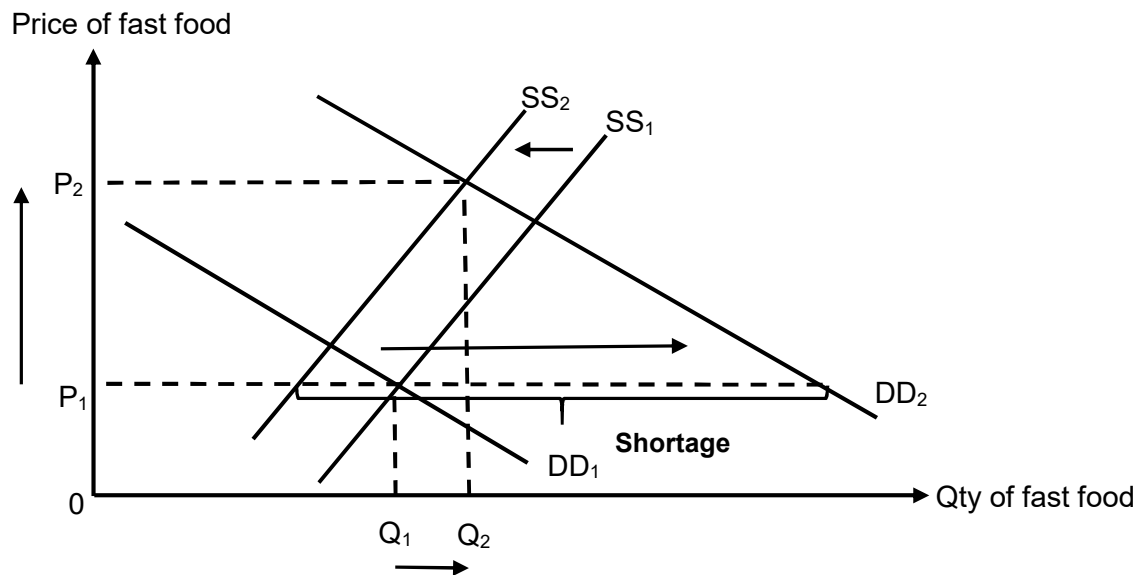
Price of fast food

Figure 10

Conclusion:

- Summary:
  Fine dining: P will rise and Qty will fall due to magnitude of the fall in supply greater than the magnitude of the fall in demand.
  Casual dining: P will rise and Qty will fall as well due to the magnitude of the rise in demand being smaller than the magnitude of the fall in supply.
  Fast food restaurants: Both P and Qty will rise due to the magnitude of the rise in demand being larger than the magnitude of the fall in supply.
- However, the above impacts on price and quantity may not be certain as it depends on several factors:
➔ The impact on P and Qty may differ for different level of income groups and it also depends on how much is the fall in their income. For high income earners, the fall in their income may be limited and since they are still earning high levels of income, they may still demand for fine dining services and not increase their demand for casual dining.
➔ As for casual dining restaurants, if they do not have any partnership with any online delivery services, the demand for their services may not necessary rise.
➔ It also depends on how much is the contribution of rental, food and manpower costs to the total costs of production to the restaurant owners. If the impact of these costs is very high, it will thus lead to a greater fall in supply and may affect the change in price and quantity more than the shift in demand.

Level	Descriptor	Marks
L3	An answer that shows adequate knowledge of demand and supply forces and how equilibrium price and quantity may be affected. Answer is balanced in consideration of demand and supply factors (combined effects are considered). **Magnitude of the shifts are examined in details.** Consideration of elasticities concepts and its relevance in influencing market equilibrium. Good use of diagrams that is adequately explained.	8 – 10
L2	An answer that shows adequate knowledge of demand and supply forces and how equilibrium price and quantity may be affected. Answer is balanced in consideration of demand and supply factors but is not well explained Relevant diagrams drawn but not well explained. Single shifts will only be awarded max of 5 marks.	5 – 7
L1	An answer that shows some knowledge of demand and supply forces and how equilibrium price and quantity may be affected.	1 - 4

E3	Providing a judgment with explanation on the final impact on price and quantity for the different types of restaurant services and evaluating the factors that may affect the final change in price and quantity.	4 - 5
E2	Providing a judgment with explanation on the final impact on price and quantity for the different types of restaurant services.	2 - 3
E1	Unexplained assessment or one that is not supported by analysis.	1