**Notes 2018 – Demand and Supply & Elasticity of Demand and Supply**

**Part 1: Theory of Demand and Supply**

1.1.1 Assumptions (Rational consumer behaviour – maximization of their **Main Definitions and Concepts**

* 1. Demand
* Demand refers to the consumer’s desire and willingness to purchase based on consumer satisfaction and the ability of the consumers' purchasing power to purchase goods and/or services at a particular period of time and the maximum level of price.
  1. Demand Curve
* The demand curve shows the inverse relationship between the price of good and the quantity demanded of the good, ceteris paribus.
* It represents the **maximum** price that consumers are willing and able to pay for 1 unit of the good

List the variables – change in taste and preference

Quote the phrase that shows this

Causation – economic explanation

## 1.6 Determinants of Demand

* + - Determinants of Demand can be classified as price and non-price determinant. Price determinant will cause a change in quantity demanded while the non-price determinants will cause a change in demand.
    - **Price of the good concerned**

An increase in the supply of the good concerned will lead to a fall in the price of the good concerned and thus, contributes to an increase in quantity demanded and vice-versa.

* + - Demand may shift when there is a change in the **price of related goods**
* Substitute is a commodity that can be used in the place of another. The decrease in price of the substituting good leads to a decrease in demand of good concerned. (nature of usage)
* Complement
* it is a good that can be used in conjunction with another. An increase in price of a complementary good results in a decrease in quantity of the good concerned. (nature of usage)
* **Change in the consumer’s real disposable income**
* Increase in income will increase the demand of a **normal** good (large proportion of income spent on it
* Increase in income will decrease the demand of an **inferior** good (small proportion income of spent on the good)
* **-depends on the income of the average earners**
  + - **Change in tastes and preferences**
* A change in tastes and preferences changes the consumers’ desired demand of the good.
* Changes in preference can be brought about by advertisements, promotions, education, culture, etc.
  + - **Population and demographics**
* Change in demographics of the population affects the potential consumers and market size of the good concerned.
* For example, an ageing population increases the demand of elderly healthcare services.
  + - **Government policies**
* Implementation of government policies and law can compel consumers to demand more for certain goods.
* For example, implementation of ERP leads to an increase in demand for cash cards and in-car payments units.
  + - **Expectation of future prices**
* An expected decrease in future prices would decrease current demand for good concerned as consumers would postpone consumption now and increase demand in future

1.7 Types of demand

* **Joint demand**: The relationship of the two goods is complementary in nature, implying that the increase in quantity demanded for good A will lead to the increase in demand for good B. (demand for bread – demand for butter)
* **Competitive demand** (substitutes in nature): The two goods are substitutes for each other, implying that the increase in quantity demanded for good A will lead to the reduction in demand for good B. For example, specially-brewed coffee and soft drinks. – serving the same need as beverages
* **Derived demand** (dependency in nature): The relationship of the two goods is linked in such a way that the demand for good A is dependent on the quantity demand of good B. For example, brick and houses. – petrol and cars
* **Increase in demand for cars will lead to increase in demand for goods which are derived demand like petrol.**
* **Composite demand**: The demand for the goods comes from many sources. (It can be used in many ways by different types of consumers.) For example, steel – can be used for ship building, cars, TV.

### 2.1 Supply

* + - Supply refers to the amount of goods and service producers are willing to produce based on profit motives and ability to produce based on production capacity to offer up for sales at particular price over a certain period of time.

### 2.2 Supply Curve

* + - The supply curve shows the positive relationship between the price of good and the quantity of goods supplied by all the producers in the industry.
    - It represents **minimum** price that all producers are willing to accept and able to produce.

🞹Supply curve is upward sloping because producers always aim to maximise profits by selling more at a higher price.

### 2.3 Change in Quantity Supplied

A change in quantity supply means that the change in production capacity is due to the change in the price of the good concerned. This is represented by a movement **along** the supply curve

2.4 Change in Supply

* + - A change in supply means that the change in production capacity is due to some other factors beside the price of the goods concerned. It is represented by the **shift** of the supply curve (See 3).

## 2.5 Determinants of Supply

* + - Determinants of supply can be classified as the price determinant (factor - △ in COP) and non-price determinants. For price determinant, it will contribute to an increase in quantity supplied (△ in SS) while for non-price determinants they will contribute to a change in supply.
    - **Price of the good concerned**

An increase in demand for the good concerned will contribute to an increase in price of the good concerned and thus, it will lead to an increase in quantity supplied.

* + - **Prices of inputs /cost of production**
* A rise in the price of the resources such as wages or price of raw materials will increase the cost of production, leading to a decrease in supply of the goods.

**Availability of resources**

* If the availability of resources is limited, the production capacity will be lesser, thus making it difficult for the industries to increase production. It is likely the cost of production will increase and thus, the supply of goods will reduce.
  + - **Prices of related goods**
* Change price of related goods can affect the supply of goods concerned.
* For example, whale meat and whale blubber are of joint supply. Hence the increase in supply of one good results in the increase of supply of another.(by-products from production can increase the SS of the other good) (beef and leather)
* Beef and milk are of competitive supply. The more cows are slaughtered for beef the less there is to produce milk.(need for similar resource) corn and rice – demand for land
  + - **Technology**
* An improvement in technology will raise productivity of the industries and help to lower cost of production and this enables the industry to increase the supply of the good.
  + - **Taxation and subsidies**
* Increase in taxation will lead to an increase in cost of production which will lead to a decrease in supply of the good.
* Increase in subsidies will lead to a reduction in cost of production which will lead to an increase in the supply of the good.
  + - **Numbers of firms**
* An increase in the number of firms in the industry will lead to an increase in the supply of the goods.
  + - **Goals of the firm**
* If the aim of the firm is to increase the production level so as to reap benefits of large scale production (reap EOS), the supply of the good will increase.
  + - **Weather and endowment of resources**
* Certain products’ production capacity is constrained by the weather condition distribution of the endowment of the natural resources and hence the supply of the good may increase or decrease.

P

S0

2.6 Types of supply

Q0

* **Fixed supply curve**: The supply of the production is restricted and fixed and it will not change in accordance to the change in the price level. For example, the fishery industry has its production capacity fixed by natural environment factor.

Fixed Supply Curve

i. Stadium capacity

ii. COE 🡪 new cars

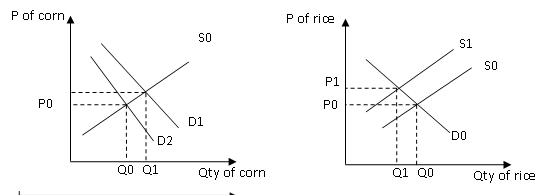
Qty

* **Joint supply**: The increase in quantity supplied of a good will lead to the increase in the supply of another good as the production of one good will create the by-products which can be used for the production of another good. The increase in the supply of these resources will lower down the cost of production for latter, thus leading to an increase in the supply of the good.
* **Competitive supply**: The increase in supply of one good will lead to the reduction of another good as the production of one good (competing for same resources) requires resources for production which is also used for the production of the good. Due to the condition of limited resources, the cost of these resources will increase which will raise the cost of production and thus, contributing to the fall in supply of the good concerned.

Competitive supply 🡪 increase in qty supply of one good will lead to reduction in the supply of another

🡪Competing for same resources

e.g. Increase in DD for corn 🡪 Increase P of corn 🡪 ↑ Qty ss of corn🡪 decrease ss of rice – competing for one of land



Increase DD for corn🡪 Increase P of corn

🡪Increase Qty SS of corn

🡪Increase DD for land to produce corn

Increase COP of Rice (Shortage of land)

🡪Decrease SS of rice 🡪 Increase P of rice

🡪Decrease Qty dd for rice

🡪reasons: competing for more same resources of land

* Why increased dd for bio-fuel will lead to increase price of rice?
* Why increase in price of oil will lead to increase in price of rice
* Increase in price of oil🡪decrease qty dd of oil🡪 increase dd for bio fuel🡪 increase dd for corn (competitive dd (oil/bio-fuel) (competitive ss) (corn/rice)

🞹**Qn: Why↑ P of oil will lead to ↑ P of rice? (types of demand and supply)**

↑P of oil 🡪↓Qty dd for oil🡪↑dd for biofuel🡪↑ dd for corn🡪↑ price of corn🡪↑ qty ss of corn 🡪 ↑dd for land 🡪↑ COP for rice 🡪↓ ss of rice 🡪 ↑P of rice

Oil and biofuel –

Corn and biofuel –

Corn and rice -

No of diagrams to be drawn

1. oil market
2. biofuel market
3. corn and rice market

increase in price of oil – increase in cost of transport – increase in cost of production for rice – decrease in supply of rice – increase in price of rice (1-2)

### PES for cash crop – price inelastic – long gestation for production

### PED for cash crop – price inelastic – high degree of necessity of demand – staple food 3.1 Market Equilibrium

* + - This condition of market equilibrium is attained when the market demand is equal to market supply. At equilibrium, the **market clearing price** and quantity is determined.
    - In this situation, buyers and sellers have no incentive to deviate from their current economic actions
    - Any change in demand and supply condition will lead to a change in market equilibrium that will depict the impact of the change in demand and supply on the market which will depict the new equilibrium price and output level
    - Impact on market for air travel due to rise in oil price and global recession
* price and o/p
* consumer and producer surplus

### 3.2 Consumer and Producer Surplus

* + - Consumer surplus is the difference between the maximum amount that consumers are willing to pay for a given quantity of good and what they actually pay (equilibrium price).
    - Producer surplus is the difference between the amount received by producers and the minimum amount that they are willing and able to accept for supplying the good.

Government regulation

1. Imposition of taxation

2. Provision of subsidy

3. Price Ceiling

4. Floor Price

**Questions for discussion**

Draw and explain the impact on the oil market when there is an increase in demand for oil which is greater than the increase in supply of oil.

Consider whether the demand or supply factors are more significant in the determination of the price for green cars.

**1) Why the demand and supply of oil is price-inelastic?**

The price of oil will also rise despite an increase in supply of oil as the increase in demand for oil is greater for oil is greater than the increase in supply of oil.

**2) Why the increase in demand of oil is greater than the increase in supply of oil?**

The price of oil will also rise despite an increase in supply of oil as the increase in demand for oil is greater than the increase in supply of oil.

Why the increase in demand for oil is greater than the increase in supply of oil?

Increase in DD is > increase in ss

1. Affluence of the people 🡪large middle Y group

2. Huge population growth

3. Difficult to increase SS🡪 non-renewable resources

🡪 Hampered by distribution

**3) Why decrease in DD for air travel is > decrease in SS of air travel? (Increase in oil price)**

1. Decrease in dd is broad- based as recessions affect most consumers

2. Decrease in SS is limited as the fixed cost is more influential factor than the rise in variable cost the rise in price of oil.

1. **Explain the impact of the occurrence of recession and a rise in oil price on the aviation industry (air travel).**
2. Explain that the impact of the aviation industry due to the above events is seen from the change in the market equilibrium of the aviation industry which will depict the change in price and output level of the air travel.
3. Explain how the recession will affect the demand for air travel. Decrease Y🡪 decrease dd for air travel 🡪 normal good
4. Explain how the rise in oil price will affect the supply of the air travel-> Increase COP 🡪 decrease SS
5. Explain the extent of change in the price and output level of the air travel industry after considering the following factors:

1) The extent of change in demand and supply of air travel, decrease in DD<decrease in SS

2) Price elasticity of demand and supply of the air travel, DD and SS are price elastic.

DD is more elastic:

* low degree of necessity
* high degree of substitution
* production of y spent is large
* time period of consideration of produce is large

SS is more elastic:

* Availability of other transport means
* Time preparation is long.

Reduction is price is minimum but reduction in qty extension.

**Part 2: Elasticity of Demand and Supply**

## **Meaning of concepts**

### **Elasticity of Demand**

* + - Elasticity of demand measures the responsiveness of change in quantity demanded as a result of change in the variables influencing it.
    - The changes in the variables are the change in the price of the goods itself, price of other goods and income of the consumers.

### **Price Elasticity of Demand (PED)**

* + - Price elasticity of demand measures the responsiveness of change in quantity demanded as a result of change in its price.
    - It is **NOT** equivalent to the slope of the demand curve.
    - Formula (state the value of PED) – value of Zero to infinity



### **Price Elasticity of Supply (PES)**

* + - Price elasticity of supply measures the responsiveness of the change in quantity supplied due to a change in the price of the good concerned. (value of zero to infinity)
    - Formula



## **Concepts of Price elasticity of Demand - Explanation or Distinguish**

1. Definition
2. Formula
3. Magnitude/Co-efficient (value / +/-)
4. Determinants
5. Uses/Implications
6. Assumptions

### PED = 0

* + - Perfectly price inelastic – when demand curve is vertical.
    - There is no change in the quantity demanded in response to the change in the price of good concerned.

### PED < 1

* + - Price inelastic - Steep demand curve.
    - The proportional change in quantity demand is less than the proportional change in the price of the good concerned.

### PED = 1

* + - Unitary price elasticity - Demand curve is a rectangular hyperbola
    - The proportional change in quantity demand is equal to the proportional change in price of the good concerned.

### PED > 1 and PED < ∞

* + - Price elastic - Gentle demand curve.
    - The proportional change in quantity demanded is greater than the proportional change in the price of the good concerned

### PED = ∞

* + - Price perfectly elastic – Horizontal demand curve.
    - The proportional change in quantity demanded is infinite when there is a change in the price of the good concerned.

### When PED is negative, the good is either normal or inferior.

### When PED is positive, the good is a giffen good.

## **Determinants of Price Elasticity of Demand**

### **Degree of Necessity**

* + - When the degree of necessity of demand for a good is high, consumers will have a less than proportionate decrease in quantity demanded when there is an increase in the price level of the good concerned as the good and does not mind the higher price level.
    - The degree of necessity is influenced by the habitual and staple nature of consumption (e.g. rice – staple food; Oil-essential resources 🡪High degree of necessity of demand)

### **Availability of Substitutes**

* + - Price and cross elasticity of demand will be price-inelastic if there are less close substitutes available.
    - This depends on the classification of the goods based on and how broadly the good is categorized in relative to other goods. The broader the market is classified, the more choices are available to the consumer and the more price elastic the demand will be when there is a change in price level.
    - The degree of availability of substitutes is also influenced by the degree of market competition; which is indirectly affected by the market demand and the number of firms in the industry. When the market competition is high as the market demand is low, the consumers will have more choices, making the demand more price-elastic.

### **Proportion of Income Spent on the Good**

* + - If the good takes up only a small proportion of the consumer’s income, the price elasticity of demand is price-inelastic as the consumer is not that price sensitive since their purchasing power is not compromised extensively. (Air passengers 🡪Ped elastic🡪Large🡪Average income earners)

### **Time Period for Consideration of Purchase**

* + - The longer the time period available for the consumer to consider their purchase, the demand will be more price-elastic as the consumers have time to look for alternatives and to consider other substitutes.

### **The Number of Possible Substitutes’ Uses**

* + - When a good can be used in many ways, the quantity demand for it will be elastic as the price reduction will be demanded by many users.
    - Even if the one group of consumers do not increase their quantity demanded as price decreases, other groups of consumers will increase their quantity demanded contributing to large change in quantity demanded of the good, influencing the demand to be elastic.

## **Explain why the price elasticity of demand for 7-11 goods is price-inelastic.**

PED for 7-11 good are price inelastic for the following reasons:

Most 7-11 goods are necessities like toothpaste, food, etc and they have a high degree of necessity which is influenced by the need for use and it is also habitual in nature of consumption like cigarettes.

Since 7-11 is opened for 24 hours, there is no close substitute for a convenience store where the consumer can make purchase in 7-11 round the clock. 7-11 stores can also conduct product differentiation by distinctive renovation of the shop and strategic location of stores that make it very convenient for the consumers that it is a logical choice for them to purchase at 7-11 stores. Hence the lack of close substitute makes PED for 7-11 goods price inelastic.

Good sold in 7-11 are usually goods that are for daily use and they do not take up a large portion of the consumers’ income. Consumers are not price sensitive and the value PED is small.

The time available for a consumer to consider buying a 7-11 good is short. For example, late night hunger pangs induce consumers to look for ‘fast food’ from 7-11. As the time for consideration is short, price elasticity is low for the goods.

1. Degree of necessity of demand – High/Low
2. Availability of substitutes – More/Less
3. time period for consideration of purchase – Short/Long
4. Proportion of income spend on the good – Small/Large

## **Uses of Price Elasticity of Demand**

### **To Help to Derive the Price Strategy – To Increase Total Revenue**

* + - When the demand is **price-elastic**, a decrease in the price of the good will lead to an increase in the total revenue as the gain in revenue due to the increase in quantity demanded is greater than the loss in revenue due to a reduction in the price of the good concerned.
    - When the demand is **price-inelastic**, an increase in price of the goods will lead to an increase in the total revenue as the gain in revenue due to an increase in price of the good concerned is greater than the loss in revenue due to a reduction in the quantity demanded.

Diagram 2

Loss in Revenue due to ↓P (P0 to P1) < Gain in Revenue due to ↑ Qty Demanded (Q0 to Q­1)

Diagram 1

Gain in Revenue due to ↑P (P0 to P1) > Loss in Revenue due to ↓ Qty Demanded (Q0 to Q­1)

P

P

Qty x

Qty x

P1

P0

P0

P1

Q1

Q1

Q0

Q0

D

D

### **The Need to Conduct Price Discrimination**

* + - Refers to the setting of 2 different price levels for the same product

*✓E.g. Cathay movie discounts for students; MacDonald’s student meal*

* + - In order to conduct price discrimination, firms must be able identify the more price-inelastic demand so as to increase the revenue by selling at higher price level for the market with the price-inelastic demand and selling at a lower price level for the market with the price-elastic demand.

*✓Ped-elastic 🡪↓P (Economy Class for air travel)*

*✓Ped-inelastic🡪↑P (1st Class for air travel)*

### **Provide Information on the Tax Policy is to be Conducted – Help Government to Set Tax Revenue**

* + - The government will impose indirect tax on goods with price-inelastic demand as the reduction in quantity demand is low even if price is increases. As a result, the tax revenue will be higher, since the number of taxable units remains high.
    - The degree of the price elasticity of demand and price elasticity of supply will determine whether the tax burden falls on the consumer or the producer, thus increasing the cost of living or cost of production. [CTB🡪↑COL, PTB🡪↑COP]
    - The consumer tax burden will be higher when the demand is price-inelastic or when the supply is price-elastic

### **Provide Information of Price Regulation should be Conducted**

* + - The degree of the price elasticity of demand and supply will determine the manner on how the government will conduct the subsidy when it conducts floor price or imposes maximum price level.
    - When the demand and supply are price-inelastic, the government will impose floor price and create a stock-pile so as to maintain the revenue for the primary producers , while maintaining stock-pile is a low cost government expenditure

### **Effectiveness of Labour Unions**

* + - If a labour-intensive product is price inelastic, the labour unions are more likely to succeed in asking for a wage increase.
    - Increase in wage 🡺 increase in COP 🡺 increase in price of product 🡺 revenue will not drop as much since product is price inelastic.

## **10. Price Elasticity of Supply**

### **10.1 Determinants of Price Elasticity of Supply**

* Price elasticity of Supply measures the responsiveness of change in quantity supplied in response to the change in price of the good itself
* Formula= Change in quantity supplied

Change in the price of good itself

### **10.1.1 Capacity of Production/ Stock of Products**

* + - The more limited the capacity of production *(e.g. agricultural product – yield from fixed land capacity),* the more price-inelastic the supply as limited production capacity means that the production capacity cannot be increased easily to accommodate the increase supply despite an increase in the price level.
    - If products are non-perishables with low storage cost, supply tend to be more price elastic.

### **10.1.2 Time Period for Production Capacity**

* The longer the time period for production, the more price-inelastic the supply as the industry has a limited capacity of production and cannot easily increase production extensively despite an increase in the price level.
* E.g. Agricultural products – Long gestation period 🡪cannot ↑SS extensively in SR🡪 PES inelastic

### **10.1.3 Cost of Resources**

* + - If the unit cost of resources is high, the cost of production is high and the industry may find it hard to increase the production capacity. Consequently a larger percentage increase in price of the good is needed to increase a certain percentage increase in the quantity supplied, contributing to a price-inelastic supply.

### **10.1.4 Number of Firms in Industry**

* + - The greater number of firms, the more price elastic as the production capacity can be easily increased where there is an increase in the price of good concerned.

**10.2 Uses of Price Elasticity of Supply**

* It depicts the extent of change in quantity demanded and change in price of the good itself when there is a change in demand for the good. When there is an increase in demand for the good, the rise in price will be sharp and the reduction in quantity will be less than proportional than the rise in price if the supply is price-inelastic
* This will explain why the supply of agricultural production is price-inelastic as the production capacity is limited by limited resource capacity as there is limited yield from limited land space

S1

P

P2

S2

P1

D2

P0

D1

Qty

Q1

Q2

Q0

↑in dd 🡪↑P🡪△Qty depends on PES

S1 – Price-inelastic 🡪 ↑P extensively

S­1 – Price-elastic 🡪 ↑P less extensively

Total revenue will increase more for price elastic supply than price inelastic supply when there is an increase in price brought about by increase in demand.

**🞹10.3 Limitations of Price-Elasticity of Demand and Supply**

* Used to explain why concepts of elasticity are irrelevant
* Magnitude of the value of PED and PES will vary as time span is longer
* Ceteris paribus condition is not possible in reality, and thus, the complexity of the economic environment will affect the value PED and PES simultaneously
* Social variables will distort the implication of the value of PED as the consumer with similar proportion of income spent on a good will have different response to change in quantity demanded because of their family background
* Concepts of elasticity cannot account for social variables which will distort the value (e.g. marriage status will distort price sensitivity), as concept of elasticity of dd/ss is a general concept

## **Uses of Price Elasticity of Supply**

### Taxation

* + - Applies to situations when PES = 0, taxation falls entirely on producers, reducing after tax income.
    - PES = ∞, where tax burden falls entirely on consumer, reducing welfare.
* value of PED/PES affect the extent of △ in price/qty
* Tax imposition 🡪 affect CTB/PTB, tax incidence and DWL
* Social variables will distort the complications of the value of Ped as the consumer with similar proportion of income spent on a good will have different response to change in quantity demanded because of their family background