Demand-Supply Cheat Sheet

Important Definitions

DD: The amount of a good that consumers are willing and able to buy at each given price over a given period of time
SS: The amount of a good that producers are willing and able to offer for sale at each given price over a given period of time
Consumers' Surplus = The difference between the maximum amount that consumers are willing to pay for a given quantity of a good and what they actually pay
Producers' Surplus = The difference between the amount received by producers for selling their good and the minimum amount that they are willing and able to accept to produce the good
PED = The measure of the responsiveness of the quantity demanded of a good to a change in its price, ceteris paribus.
YED = The measure of the responsiveness of demand of a good to a change in the consumers' income, ceteris paribus.
XED/CED = The measure of the responsiveness of demand of a good to a change in the price of another good, ceteris paribus.
PES = The measure of the responsiveness of quantity supplied to a change in the commodity's own price, ceteris paribus.
Specific Tax = A constant sum levied on each unit of the good sold.
Ad Valoreum Tax = A tax pegged at a certain percentage of the price of the good.

Marking points for pure DD-SS essays

- 3 Markets
- PED, PES, XED, YED
- P, Q
- TR/TE, CS, PS

Demand

- Qd inversely related to P, ceteris paribus
    - Income effect: ↑P ⇒ ↓p.p. ⇒ ↓ real income ⇒ Consumer is able to afford less of the good ⇒ ↓Qd
    - Substitution effect: ↑P ⇒ Consumers substitute relatively cheaper goods for that good in order to maximise satisfaction with given income ⇒ ↓Qd
- Demand curve = Maximum price consumers are willing and able to pay for each quantity of the good
- Law of diminishing marginal utility
    - ↑Q consumed ⇒ ↓ Additional utility from additional unit of good ⇒ in order for one to be willing to buy greater quantity of goods, price has to be lower
- Non-price determinants of demand (TIGER PIE)

    - **T**aste and Preferences
    - **I**ncome
        - YED value
    - **G**overnment Policies
        - Direct taxes/subsidies
    - **E**xpectations of Future Prices
    - Prices of Inter**R**elated Goods
        - Substitute
        - Complement
        - Derived Demand
    - **P**opulation
    - **I**nterest Rates
    - **E**xchange Rates
- Consumers' Surplus = Max consumers are willing to pay - Actual price

Supply

- Qs directly related to P, ceteris paribus
    - Beyond a certain output level, workers have to be paid overtime and machines reach working capacity ⇒ ↑MC ⇒ Require ↑MB to cover ↑MC ⇒ Require ↑P to incentivise firms to ↑Qs
- Supply curve = Minimum price producers are willing and able to supply for each quantity of the good
- Non-price determinants of supply (ECoNNS GP)
    - **E**xpectations of Future Prices
    - **Co**sts of Production
    - **N**atural Factors
    - **N**umber of Firms
    - **S**tate of Technology
    - **G**overnment Policies
        - Indirect taxes/subsidies
    - **P**rices of Interrelated Goods
        - Joint Supply
        - Competitive Supply
- Producers' Surplus = Actual price - Min producers are willing to sell

For Essay: Related markets

- DD
    - Substitutes (XED +ve)
    - Complements (XED -ve)
    - Derived Demand (↑DD of A ⇒ ↑DD of B)
- SS
    - Joint Supply (↑P of A due to ↑DD ⇒ ↑Qs of A ⇒ ↑SS of B)

- Competitive Supply (↑P of A due to ↑DD ⇒ ↑Qs of A ⇒ ↓SS of B)

**Price Adjustment Process

How to explain fall in prices

1. SS and/or DD curve shifts
2. At current price P_0, quantity supplied, Qs, exceeds quantity demanded, Qd
3. Surplus of QdQs in the market exerts a downward pressure on prices
4. Producers are unable to sell at that price and thus will lower their prices in order to clear excess stock
5. Consumers recognise the surplus and hence, offer lower prices
6. Market price will fall until equilibrium price (i.e. quantity demanded = quantity supplied) reached
7. New equilibrium price at P_1 and equilibrium quantity at Q_1

How to explain rise in prices

1. SS and/or DD curve shifts
2. At current price P_0, quantity demanded exceeds quantity supplied
3. Shortage of QsQd in the market exerts a upward pressure on prices
4. Consumers are unable to purchase all they want of the good and thus will offer higher prices
5. Producers recognise the shortage and are willing to increase quantity supplied at higher prices
6. Market price will rise until equilibrium price, where quantity demanded = quantity supplied, is reached
7. New equilibrium price at P_1 and equilibrium quantity at Q_1

If simultaneous shift, direction of change of either P or Q would be indeterminate, must consider:

- Extent of shift of DD and SS curves
  - Use YED/XED
- Relative PED and PES values

Price Mechanism

- Functions:
  1. Signalling: Prices communicate information of surplus/shortage to decision-makers
  2. Rationing: Prices ration scarce resources when demand is greater than supply by deterring some consumers from purchasing the good

3. Incentive: Prices motivate decision-makers to respond to information by acting as an incentive to raise output to make higher profits

How price signals achieve efficient allocation of resources?
Assumptions:

- Markets are perfectly competitive with no single producer or consumer having a significant market power to influence the market demand and supply
- Both consumers and producers are rational and driven by self-interest
- Absence of all sources of market failure
- There is freedom of choice and enterprise
    - Consumer sovereignty - Free to decide what to buy with their incomes
    - Producers free to choose what to sell and what production methods to use
- Private ownership of property

Allocative efficiency:

- Demand is the amount of goods and services that consumers are willing and able to purchase at each given price level over a given period of time
    - In the pursuit of self interest, consumers will seek to maximise CS ⇒ Consumers willing to increase Qd when P falls, c.p.
    - Law of diminishing marginal utility where marginal utility decreases as quantity of the good consumed increases ⇒ DD curve is downward sloping
    - DD curve represents value of the good to consumers ⇒ Consumers' MB derived from consuming additional unit of the good
- Supply is the amount of goods and services that producers are willing and able to produce at each given price level over a given period of time
    - In the pursuit of self-interest, producers will seek to maximise PS ⇒ Producers only willing to increase Qs if P increases c.p.
    - Law of diminishing marginal returns in production ⇒ Increasing marginal costs of production ⇒ SS curve is upward sloping
    - SS curve represents MC of producing an additional unit of the good
- Allocative efficiency achieved when value society places on the last unit of the good (P) = Opportunity cost in terms of resources used in producing the last unit of the good (MC) ⇒ i.e. When DD=SS ⇒ Maximises society's welfare as CS and PS maximised

How prices achieve efficient allocation of resources (i.e. Why equilibrium output and price is at DD=SS):

- Prices perform signalling function and incentive function
    - Provide information to both producers and consumers about changes in market conditions
        - e.g. When DD increases, at current price levels, there is a shortage

created as Qs is less than Qd ⇒ Upward pressure on prices ⇒ Rise in price is a signal to consumers to reduce Qd along the DD curve + incentivises producers to increase Qs along the SS curve ⇒ More resources reallocated to the market due to price signals ⇒ When price finally reaches new equilibrium where DD=SS, shortage is eliminated as Qd = Qs ⇒ Society's welfare is maximised ⇒ Achieves allocative efficiency

- Prices perform rationing function
  - Prices serve to ration scarce resources when DD > SS
    - e.g. When DD increases, at current price levels, there is a shortage ⇒ Consumers bid up prices ⇒ Only consumers with the willingness and ability to pay will be able to consume the goods produced
- How producers decide how to produce
  - Increase in prices incentivises producers to increase production ⇒ Demand for factors of production is a derived demand ⇒ Producers willing to pay more for factors of production ⇒ More factors of production channeled from other industries to the industry with higher demand to increase production ⇒ More resources reallocated to the market
  - Producers decide which factors of production to use based on the relative prices of the factors of production
    - e.g. If labour is relatively more expensive, producers will use more capital goods

Elasticity Concepts

- PED = % Change in Qd/% Change in P of good
  - Determinants
    - **S**ubstitutes
    - **H**abitual consumption
    - % **I**ncome spent
    - **T**ime period
- YED = % Change in Qd/% change in income
  - YED value
    - Inferior good: YED<0
    - Income inelastic good (Necessities): 0<YED<1
    - Income elastic good (Luxury): YED>1
  - Determinants
    - Economic development of the country
    - Income of consumer
- XED/CED (Qd of B w.r.t. to P of A) = % Change in Qd of good B/% Change in P of good A
  - XED value
    - Substitutes: CED>0

        - Complements: CED<0
        - The larger the magnitude of CED, the greater the degree of substitutability/complementarity
- PES = % Change in Qs/% Change in P
    - Determinants
        - Stocks/Spare capacity
        - Time period
        - Factor mobility
        - Number of firms

Relevance of elasticity concepts

- Government
    - Effectiveness of indirect taxes in reducing quantity transacted
        - PED
    - Amount of tax revenue collected
        - PED
    - Price volatility in certain markets
        - PED, PES, YED, XED
        - Government may want to impose measures to ensure price stability due to equity concerns (esp if good is a necessity)
- Firms
    - Price and output decisions to ↑ TR
        - PED
    - Timing of pricing and marketing decisions to ↑ TR
        - PED
        - SR: Pricing strategies
        - LR: Product differentiation
    - Practise price discrimination to ↑ TR
        - PED
    - Produce the appropriate range of products to cater to different income groups
        - YED
    - Relative extent and direction of change in DD as a result of rivals' actions
        - XED
        - Firm would respond to rival's pricing strategies if their good has high positive XED in relation to rival's product
        - Firm may seek to product differentiate if goods are close substitutes
        - Firms selling complementary goods may seek to collaborate
    - Relative extent and direction of change in DD as a result of changes in national/global economic conditions or trends of income levels
        - YED
        - Firms may choose to diversify their product range to ensure stable profits in times of economic recession (inferior goods)
- Limitations
    - Difficulty in calculating exact values since market conditions would change over time

    - Estimates become outdated quickly
    - Ceteris paribus assumption is unrealistic

Government Intervention

- Indirect taxes/subsidies
    - Types:
        - Specific tax
        - Ad valoreum tax
    - Relative extent of incidence of tax/subsidy on consumers depends on relative PED and PES values
        - Determines relative price sensitivity of consumers and producers
        - Impact always on producers but incidence can be shifted to consumers
    - Allocative inefficiency due to under-allocation of scarce resources
- Price floor
    - Set above market equilibrium price
    - Provide income support for farmers and protect low skilled, low wage workers
    - Disadvantages
        - Surplus
        - Allocative inefficiency due to over-allocation of scarce resources
        - Minimum wage
            - Firms may develop and switch to labour-saving techniques of production
            - May lead to illegal employment of workers at wages below legal minimum wages
- Price ceiling
    - Set below market equilibrium price
    - Achieve equity and make necessities more affordable for low-income earners
    - Disadvantages
        - Shortage
        - Allocative inefficiency by under-allocation of scarce resources to the production of the good
        - Need for alternative rationing mechanisms (e.g. coupons/queues)
        - Emergence of black markets as people sell goods illegally at prices above the maximum price
    - Supply-side solutions
        - Drawing on past surpluses
        - Engage in direct production
        - Give subsidies/tax relief to producers
    - Demand-side solutions
        - Controlling income
        - Providing more alternatives