

# LEAVING CERT



## MICROECONOMICS FORMULA SHEET

- **Percentage Change** =  $(\text{Change Value} / \text{Original Value}) \times 100$

For example, if your weight in summer was 60 kg and went up to 72 kg in winters, then the percentage change is  $(72-60/60) \times 100 = 20\%$ .

- **Law of Equi-Marginal Returns** =  $(\text{MU of X} / \text{Price of X}) = (\text{MU of Y} / \text{Price of Y})$

This law states that consumers will be in equilibrium when they spend equal amount per unit of Marginal Utility (MU) on Good X and Good Y.

For instance, if the MU of X is 3 and Price of X is 1 and MU of Y is 4 and Price of Y is also 1, then the consumer will buy more of Y and less of X till the time

$$(\text{MU of X} / \text{Price of X}) = (\text{MU of Y} / \text{Price of Y}) = 3$$

- **Price Elasticity of Demand (PED)** =  $(\text{Change in Quantity} / \text{Change in Price}) \times (\text{Price prior} + \text{Price new} / \text{Quantity prior} + \text{Quantity new})$

Price Elasticity of demand measures the change in quantity demanded due to change in price only using the above formulae

Absolute value of PED > 1 - Relatively elastic

Absolute value of PED < 1 - Relatively inelastic

Absolute value of PED = 1 - Unitary elastic

For example, if the price of good was 1 and the quantity demanded was 100. Now the price of good has been increased to 1.2 and quantity demanded decreased to 60. The Price elasticity of

demand is  $(-40/0.20) * (1+1.2) / (100+60) = -2.75$ . Here the absolute value of PED is more than 1, hence the good is relatively elastic.

- **Income Elasticity of Demand (IED)** = (Change in Quantity/Change in Income) x (Income prior + Income new) / (Quantity prior + Quantity new)

Income Elasticity of demand measures the change in quantity demanded due to change in income, keeping other things constant

IED > 1 - Normal Good - Ferrero Rocher Chocolates

IED < 1 - Inferior Good - Unbranded Chocolates

For example, if your demand rises from 20 units to 40 units as your income rises from 1000 to 1500, the income elasticity of demand is  $(20/500) * (2500/60) = 1.6667$

- **Average Cost (AC)** = Total Cost / Quantity (**1st formulae**)
- **Average Fixed Cost (AFC)** = Total Fixed Cost / Quantity
- **Average Variable Cost (AVC)** = Total Variable Cost / Quantity
- **Average Cost (AC)** = AFC + AVC (**2nd formulae**)
- **Marginal Cost (MC)** = Cost of producing n unit - Cost of producing n-1 unit

For example, if the cost of producing 6 units is 600 and cost of producing 7 units is 750, the Marginal Cost of 7th Unit is 150 (750-600).

- **Short Run Perfect Competition Condition**
  - MR curve = MC Curve
  - MC cuts MR from below (MC Curve is rising because of increasing variable cost)
  - AVC is covered (We don't care about AC since covering AC is a condition in Long Run Perfect Competition)
- **Long Run Perfect Competition Condition**
  - MC curve = MR curve
  - MR = AR = Price

- MC cuts MR from below (MC Curve is rising because of increasing variable cost)
- Price = AC (We are earning enough to cover long term average cost curve)

- **Imperfect Competition Condition**

- MC Curve = MR Curve
- MC cuts MR from below (MC Curve is rising because of increasing variable cost)
- There might be short term economic profit or losses

- **Imperfect Competition Condition**

- MC Curve = MR Curve
- MC cuts MR from below (MC Curve is rising because of increasing variable cost)
- MC = MR = AC (In Imperfect Competition, firms cannot earn long run economic profit)

- **Four Firm Concentration Ratio (FFCR) = (Sales<sub>1</sub> + Sales<sub>2</sub> + Sales<sub>3</sub> + Sales<sub>4</sub>)/4**

- If FFCR > 0 and FFCR < 0.5 - Low Concentration/ High Competition
- If FFCR > 0.5 and FFCR < 0.80 - Oligopoly/ Low concentration
- If FFCR > 0.80 - Monopoly/High Concentration

- **Herfindahl-Hirschman Index (HHI) =  $\sum s^2$**  where s is the market share of firms

**Herfindahl-Hirschman Index (HHI)** ranges from 0 to 10000. 0 means perfect competition and 10000 means monopoly.

For example, Firm 1 has share of 40%, Firm 2 has share of 30% and Firm 3 has share of 20% and Firm 4 has share of 10%, then the HHI of industry is

$$40^2 + 30^2 + 20^2 + 10^2 = 3000.$$

# MACROECONOMICS FORMULA SHEET

- **GDP Formulas:**

- **Expenditure Method**

$$\text{GDP} = C + I + G + (X - M)$$

$$\text{GDP} = \text{Consumption} + \text{Investment} + \text{Government Expenditure} + \text{Net Exports}$$

- **Output Method**

$$\text{GDP} = \text{Sum of all the output produced by the firm in an economy}$$

- **Income Method**

$$\text{GDP} = \text{Sum of all the income paid to factors of production}$$

- **Gross National Product**

$$\text{GNP} = \text{GDP} + \text{Net Factor Income from the rest of the world}$$

Net Factor Income from the rest of the world = Income earned by Irish factors abroad that is sent to Ireland **minus** Income earned by foreign factors in Ireland that is sent abroad

- **Gross National Income**

$$\text{GNI} = \text{GNP} + \text{EU subsidies} - \text{EU taxes}$$

- **Gross National Disposable Income**

$$\text{GNDI} = \text{GNI} + \text{Current transfer from Rest of the world} - \text{Current transfer to rest of the world}$$

- **Marginal Propensity to Consume (MPC)**

$$\text{MPC} = \frac{\text{Change in Consumption}}{\text{Change in Income}}$$

$$\text{MPC} = 1 - \text{MPS}$$

- **Marginal Propensity to Save (MPS)**

$$\text{MPS} = \frac{\text{Change in Savings}}{\text{Change in Income}}$$

$$\text{MPS} = 1 - \text{MPC}$$

- **Marginal Propensity to Import (MPM)**

$$\text{MPM} = \text{Change in Imports} / \text{Change in Income}$$

- **Marginal Propensity to pay Tax (MPT)**

$$\text{MPT} = \text{Change in taxes paid} / \text{Change in Income}$$

- **Multiplier Formula**

- Increase in National Income = Injection \* Multiplier
- Multiplier =  $1/1-\text{MPC}$
- Multiplier =  $1/\text{MPS}$
- Multiplier =  $1/(\text{MPS} + \text{MPM})$
- Multiplier =  $1/(\text{MPS} + \text{MPM} + \text{MPT})$

- **Debt to GDP ratio**

$$\text{Ratio} = \text{Total Debt} / \text{Total GDP}$$

- **Money Multiplier**

$$\text{Money Multiplier} = 1 / \text{Reserve Ratio}$$

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