ECON 101 - Principles of Microeconomics

Economic Principles

1. Scarcity Principle: Stuff is scarce
2. Choice Principle: People make decisions as tradeoffs
3. Opportunity Cost Principle: The cost of something is what you give up to get it
4. Increasing Opportunity Cost Principle: Rational producers use the lowest OC input first
5. Coordination Principle: Free markets automatically coordinate
6. Efficiency Principle: Efficiency is better than inefficiency
7. Maximization Principle: Individuals prefer happiness over unhappiness
8. Cost-benefit (Marginal) Principle: Take action when marginal benefits exceed extra costs
9. Specialization Principle: Specialization of labor requires trade and markets
10. Comparative Advantage Principle: Trade may lead to gains from trade
11. Intervention Principle: Sometimes government may improve on market outcomes
12. Equilibrium Principle: If you are there, you will stay there; Remains constant over time
13. Stability Principle: If you are not there, you will go there

Chapter 1: Economics Concepts and Issues

1. What is economics

   Economics is the study of the **management** of **scarce resources** to **satisfy unlimited wants** (how to make decisions, how to choose)

   - Resources
     - Input = Factors of production = **Resources**

       Output = **Goods and Services**

        - Production (process): transforming inputs into outputs
        - Consumption (process): satisfying human wants with outputs
        - Five factors of production
            - Capital
                - Land
                - Labor
                - Technology
                - Entrepreneurship
- Scarcity
    - Limited, bounded, inadequate ($Q_d > Q_s$, when $P = 0$)
    - Inputs → Outputs are **limited**; Wants are **unlimited**
    - Economics: manages these factors; Politics: decides among the unlimited desires
    - Scarce good vs. Free good
- Choice
    - Scarcity implies choice, made by evaluating costs
- Opportunity Cost (Benefits that are LOST)
    - **Value/benefit** of the **next-best** forgone alternative;

      value of **what is given up** to have the item;

      a ratio;

      What would have been had?
    - Four elements
        - Value: subjective - a **benefit**
        - Next-best: what would have been chosen
        - Foregone: what is given up
        - Alternative: choice
    - Only include costs affected by the choice: excludes **sunk cost** (cost incurred in past that cannot be recovered, thus irrelevant)
    - Do "A" until marginal cost of "A" = marginal benefit of "A"
- Production Possibility Curve

        - Shows **all possible** combinations of **production**, if **all** inputs are **fully and efficiently** employed
        - **Law of Increasing Marginal Opportunity Cost**: Opportunity cost of producing "A" increases as more "A"s are produced
        - Scarcity: Right of Line
            - Point on line - inputs fully and efficiently employed - maximum output
            - Point under the curve - inputs underused and inefficiently used
        - Choice: Negative slope
            - Cannot produce more of both
            - Cannot produce more of one without less of the other
        - OC: Value of slope
        - Efficiency: Shift of PPC
            - Shifts right: same input, more output
        - The most efficient factors are used first and the most inefficient factors are switched out first
        - Increase productivity → Increase efficiency → Shift PPC to the right (outward)
        - Where to be on PPC?
            - Marginal Cost = Marginal Benefit
- 4 economics problems
    - Microeconomics
        - Production - What is produced and by whom? - Allocation of resources
        - Consumption - What is consumed and by whom? - Distribution of income
    - Macroeconomics
        - Idle capacity - Why is the economy below PPC?
        - Increase capacity - How to shift PPC outwards?
- Government policy
    - Shape allocation of resources to correct market failures (efficiency)

        - Address distribution of income to correct fairness (equity)
        - Unemployment and inflation (output gaps)
        - Economic growth (increase capacity)

2. Complexity of the modern economy
    - Nature of market economies
        - Self-organizing economy
            - Spontaneous economic order
            - Self-organizing
            - Wealth of Nations - invisible hand
        - Efficiency
            - Free markets: relatively efficient
            - Efficiency: Sellers produce what buyers want at the least cost
            - Coordinate through **price**
            - May fail (efficiency) or be unfair (equity)
        - Incentives
            - Incentives Principle: rational decision makers respond to incentives
            - Rational Self-interest Principle: rational decision makers take actions that decrease their individual costs and increase their individual benefits
            - Markets governed by "rules of the game"
                - Government, institution, rule of law, contract...
    - Decision makers
        - Households
            - consistent actions
            - maximize satisfaction
            - input (labor) $\leftrightarrow$ income
            - spend income on goods and services
        - Firms
            - consistent actions

        - maximize profits
        - output ↔ income
        - spend income on factors of production
    - Governments
        - Do not act consistently
        - May not maximize anything
    - Rest of the world
        - act like rational consumers and producers
- Circular Flow of Income
    - Spendthrift economy: excessive spending, lack of saving
    - Frugal economy: spend money wisely, save money for future uses
    - Governed economy: regulated by government body
    - Open economy: other countries engage in trade of products
    - Injections: Exports, Government expenditure, Bank investments
    - Leaks (Withdrawals): Imports, Taxes, Savings
- Production and Trade
    - Specialization of labor: one product/service produced/provided by one **specialized** worker
    - Division of labor: One product **divided** into individual tasks, each done by different workers
    - Specialize/Division → Efficiency → Trade → Markets
    - Everyone wins when individuals specialize in doing something in which they have a **comparative advantage** (being able to produce a product a lower opportunity cost)
- Globalization
    - Advancements in transportation and communication
    - Increased **international trade**, increased **world GDP per capita**

3. Alternative to the market economy
    - Types of economic systems
        - Traditional
            - based on tradition

        - unchanging environment
        - feudal system
    - Command
        - central planning authority
        - requires **forecasting** - difficult
        - 5-year plans
    - Free
        - private households and firms
        - decentralized decisions
        - price system to coordinate sellers and buyers
    - Mixed
        - private and public sectors
        - spectrum
- Free vs. Command
    - Adam Smith: efficiency and allocation of resources;

      Karl Marx: equity and distribution of incomes
    - Command: may be good for **transition** from traditional economies
    - Market: difficulties with **market failures** and **equity**
    - Mixed: may trump Command and Free?
    - Efficient allocation $\neq$ Equitable distribution
    - Free economy $\neq$ Democratic politics
    - Failure of central planning
        - misplaced incentives
        - failure of coordination
        - failure of quality control
        - environmental degradation
- Economics integrate with other social sciences
    - Political science, psychology, sociology, history, philosophy, law
- Government in a mixed economy
    - Market: voluntary transactions + free choice

- Government: enforcing legal system to reinforce the economic system
    - Private property; Freedom to contract
- Deals with market failures
    - Monopolies
    - Externalities (pollution)
    - Public goods (Army)
    - Asymmetrical information (Insurance)
    - Merit goods

Chapter 2: Economic Theories

1. Positive vs. Normative
    - Distinction
        - Positive: objective and testable
        - Normative: value judgement
    - Reasons of economists disagreeing with each other
        - different definitions, assumptions, values
        - short run vs. long run perspective (the savings paradox)
2. Building and Testing theories
    - Theories
        - General concepts
            - The Law of Large Numbers: random movements of individuals offset one another

              Group behavior easier to predict than individual behavior
            - **AS IF** test: Individuals acts **as if** the goal is to maximize happiness
            - Theory - Model
                - Explains **why** a relationship exists
                - Testable
                - Can ONLY be **disproven**, not proven

- Components
    - Variables
        - Endogenous variables (dependent/induced variables)
        - Exogenous variables (independent/autonomous variables)
    - Assumptions (Definition, Behavior, Condition)
        - Motives: psychological
        - Causation: one factor causes the other
    - Predictions/Hypotheses
        - Propositions that can be **logically inferred** from assumptions
        - if - then: cause and effect
    - "For the reason that..., it follows that..."
- Testing
    - Rejection vs. Confirmation
        - Refutation test: can the theory be **refuted** by evidence
        - Confirmation test: yield inconclusive results by evidences **confirming** the hypothesis
    - Statistical analysis
        - statistical methods - randomized control trials
    - Correlation vs. causation
        - Correlation: 2 variables move together
        - Causation: reasoning

3. Economic data
    - Index numbers
        - Compare two time series with **different units of measurement** and "absolute values"

          Compare **relative** changes rather than **absolute**
        - CPI = weighted average of representative basket of consumer goods
        - **Base year** = unity; Ratios to solve

- Graphing Economic Data
    - Cross-sectional data: observations made at the **same time** across **different units**
    - Time series data: observations made **across time** for the **same unit**
    - Scatter diagram: observations for pairs of variables

Chapter 3: Demand and Supply

1. Theory of Demand
    - Definition of quantity demanded
        - Quantity **household wants** to purchase, **given** the own price, **ceteris paribus**
        - Flow variable (over time) vs. Stock variable (Point in time)
    - Slope of Demand curve
        - Inverse/negative relationship between P and Q_d
        - Curve convex to origin
        - Marginal: Incentive = Benefit - Cost
    - $Q_d = f(P)$, ceteris paribus
    - Shifts in Demand
        - Ceteris paribus variables
            - Income
                - Normal - Income increases, Q_d increase
                - Inferior - Income increases, Q_d decrease
            - Taste
            - Advertisement
            - Related good
                - Complement: used jointly
                    - Honey and beeswax: $P(Honey)$ increases, Q_{Honey} decreases, $Q_{beeswax}$ decreases while $P(beeswax)$ stay the same $\rightarrow$ Demand of beeswax shifts to the left

        - Substitute: used alternatively
            - Pepsi and CocaCola: $P(Pepsi)$ increases, Q_{Pepsi} decreases, $Q_{CocaCola}$ increases while $P(CocaCola)$ stay the same $\rightarrow$ Demand of CocaCola shifts to the right
        - Expectations
    - $\Delta P \rightarrow \Delta Q_d$: moves along the curve; Change in ceteris paribus: shifts
2. Theory of Supply
    - Definition of Quantity supplied
        - Quantity the **firm wants** to sell, given the **own price**, **ceteris paribus**
        - Flow variable
    - Slope of Supply
        - Direct/Positive relationship between P and Q_s
        - Curve, convex to origin
        - Marginal Incentive = Benefit - OC
    - $Q_s = f(P)$, ceteris paribus
    - Shifts of Supply (Move-along vs. Shift)
        - Input Price
        - Technology
        - Taxes/subsidies
        - P of related good
            - Complement
                - $P_{oil} \downarrow \rightarrow Q_{oil} \downarrow \rightarrow Q_{gas} \downarrow$, P_{gas} stays the same, supply curve of gas shifts left
            - Substitute
                - $P_{wheat} \downarrow \rightarrow Q_{wheat} \downarrow \rightarrow Q_{corn} \uparrow$, P_{corn} stays the same, supply curve of corn shifts right
        - Expectations
        - Ultimately, most variables affect **Costs**: inverse relationship

- For the same price, if costs decreases, $Q_s \uparrow$, shifts to the right; if cost increases, $Q_s \downarrow$, shifts to the left

3. Equilibrium
    - Desired Q: Q_d, Q_s can be different
    - $Q_{exchanged}$: small number rule
    - Q_e is reached when $Q_s = Q_d$.
    - Stability
        - Equilibrium: Demand = Supply
        - Equilibrium Price: P at $Q_d = Q_s$
        - Disequilibrium: Demand $\neq$ Supply
        - Disequilibrium Price: any P for $Q_d \neq Q_s$
        - Excess demand: $Q_d > Q_s$
        - Excess supply: $Qd < Q_s$
        - $P \to P_e$
    - Laws of Supply and Demand
        - Shift Demand and Supply curves will yield different P_e and Q_e depending on what is being shifted
        - Shifts: superimpose different times on same graph
        - What matters: Relative Price (in terms of another good: ratio of absolute prices) > Absolute Price (in terms of money)

Chapter 4: Elasticity

1. Price elasticity of demand
    - Measurement

$$P_{\eta_D} = \frac{\frac{\Delta Q}{Q}}{\frac{\Delta P}{P}} = \frac{\frac{Q_2 - Q_1}{\frac{Q_2+Q_1}{2}}}{\frac{P_2 - P_1}{\frac{P_2+P_1}{2}}}$$

    - Inelastic: Q_d irresponsive to P change, $-1 < \epsilon = P_{\eta_D} < 0$
    - Elastic: Q_d responsive to P change, $\epsilon = P_{\eta_D} < -1$

- Position + Inclination
    - Same inclination, Demand curves shifts to the right, $\frac{P}{Q}$ decreases, elasticity decreases in absolute value $\rightarrow$ More inelastic
    - Same position, steeper inclination $\rightarrow$ $\frac{\Delta Q}{\Delta P}$ decreases in absolute value $\rightarrow$ elasticity decreases, more inelastic
- Terminology
    - $\epsilon = 0$: perfectly inelastic, quantity demanded does NOT respond to price change; vertical line
    - $|\epsilon| < 1$: inelastic, Q_d irresponsive to P change, steep negative slope
    - $|\epsilon| = 1$: unitary elastic, relative ΔQ_d = relative ΔP, hyperbola
    - $|\epsilon| > 1$: elastic, Q_d responsive to P change, flat negative slope
    - $\epsilon = -\infty$: perfectly elastic, P does not change with Q_d, horizontal line
- Factors affecting Price elasticity of Demand
    - affected by **Availability of Substitutes of Outputs**
    - More/better substitutes of outputs, more elastic
    - The larger the set, the more inelastic the set is
    - More expensive items tend to have higher elasticity
    - Effect of time
        - In the long run, new substitutes are produced for **competition**, demand curve becomes more elastic
    - Type of Goods
        - Luxury: usually elastic
        - Necessity: usually inelastic
- Elasticity and total revenue
    - Total revenue = $P_{exchanged} \times Q_{exchanged}$
    - Elastic demand curve
        - Total revenue $\uparrow$ as $P \downarrow$
    - Inelastic demand curve
        - Total revenue $\downarrow$ as $P \downarrow$

- Elasticity along straight line demand
    - ϵ = position $\times$ inclination
    - When inclination remains the same for the straight demand curve, only position matters
    - When moving down the straight line, elasticity decreases, more and more inelastic
    - Along a straight line demand, total revenue is maximized when $\epsilon = -1$

2. Price elasticity of supply
    - Measurement: same formula, but for supply curves
    - Terminology
        - $\epsilon = 0$: perfectly inelastic, quantity demanded does NOT respond to price change; vertical line
        - $\epsilon < 1$: inelastic, Q_d irresponsive to P change, steep negative slope
        - $epsilon = 1$: unitary elastic, relative ΔQ_d = relative ΔP, hyperbola
        - $\epsilon > 1$: elastic, Q_d responsive to P change, flat negative slope
        - $\epsilon = \infty$: perfectly elastic, P does not change with Q_d, horizontal line
    - Factors affect price elasticity of supply
        - affected by **Availability of Substitutes of Inputs**
        - More/better substitutes of inputs, more elastic
        - Availability of factors of production $\leftrightarrow$ Costs
            - **Fungible** factors of production (elastic): Output $P_{wheat} \uparrow$, if it is cheaper to acquire more inputs from the production of **oats**, producer will increase output greatly
            - **Non-interchangeable** factors of production (inelastic): Output $P_{wheat} \uparrow$, if it is expensive to acquire more inputs from the production of **cranberries**, producer will **NOT** increase output very much
        - Costs
            - Increase slowly as Q_s increase, elastic

        - Increase rapidly as Q_s increase, inelastic
    - Time
        - More elastic in long run because "higher production efficiency keeps costs down"

3. Elasticity and Taxation
    - Excise tax: consumption/sales/indirect tax on specific good
    - Tax incidence: who ultimately pays the tax
        - $= P_c - P_s$
        - Above P_e: Taxation on consumer
        - Below P_e: Taxation on producer

4. Income elasticity on demand
    - $$Y_{\eta_D} = \frac{\frac{\Delta Q}{Q}}{\frac{\Delta Y}{Y}}$$
    - Responsiveness of Q_d to a change in **income**
    - Categories
        - Normal luxury (superior): $\epsilon > 1$, income elastic
        - Normal necessity (normal): $\epsilon < 1$, income inelastic
        - Inferior (abnormal): $\epsilon < 0$, more income, less willingness to consume
    - Factors
        - Characteristic
            - Necessity: inelastic
            - Luxury: elastic
        - Income
            - As income rises, shifts from necessity to luxury

5. Cross-elasticity of Demand
    - Measurement
    - $$P_{\eta_{XY}} = \frac{\frac{\Delta Q_X}{Q_X}}{\frac{\Delta P_Y}{P_Y}}$$
    - responsiveness of Q_d of X to a change in the P of good Y, *ceteris paribus*

- $\epsilon < 0$: X and Y are complements
- $\epsilon > 0$: X and Y are substitutes

Chapter 5: Price Controls & Market Efficiency

1. Interaction among markets
    - Spillovers and Feedbacks
        - Oil production technology ↑
            - Oil market: Costs ↓, increase in S, drop in P
            - **Spillover** into labor: increase in Demand for inputs, increase in Price for inputs
            - **Feedback** in the Oil market: Costs increase, drop in S, increase in P
    - General Equilibrium = analysis of **all** markets **simultaneously**, market interact with **spillovers or feedbacks**
    - Partial equilibrium = analysis of ONE market (static analysis - at a point in time), assuming no feedbacks, for relatively small markets
2. Government controlled prices
    - Disequilibrium price
        - $Q_{exchanged} = \min(Q_d, Q_s)$
    - Price floors
        - Above P_e
            - minimum price at which the product cannot be sold below
            - excess supply → unemployment, "stockpiling"
                - Winners (sellers who sell Q_d) and losers (buyers, sellers who have excess supply)
        - Below P_e: ineffectual
        - Example: Minimum wage for labor market
    - Price ceilings
        - Above P_e: ineffectual
        - Below P_e

- maximum price at which the product cannot be sold above
- excess demand → labor shortage, "dumping"
- Winners (buyers who buy Q_s) and losers (sellers, buyers who have excess demand)

- Methods of allocating shortage of supply
  - First come, first served
  - Seller's preferences
  - Rationing
  - Black markets
- Black market
  - products sold at price that violates legal price control
  - If $P_2 > P_e > P_1$ for $Q_s = Q_{exchanged}$, then black marketeers buys at P_1, sells at P_2 (on black market), and reaps profit of $(P_2 - P_1) \times Q_s$
- Example: Rent control for housing market

3. Market/Allocative efficiency
   - Demand is the **maximum price** consumer is **willing** to pay;

     Supply is the **minimum price** producer is **willing** to accept;

     for a certain Q
   - Decreasing Marginal Benefit + Increasing Marginal Cost
   - Economic surplus
     - Cooperative surplus, total surplus, net benefit to society
     - Benefit to consumers − Cost to producers
     - Market efficiency is maximizing economic surplus
       - Free market can reach market-clearing equilibrium
       - Demand = Supply
       - Perfect competition
   - Price control
     - DWSL - dead weight social loss: reduction of total surplus → market inefficiency

       Redistribution happens

- Price ceiling, price floor, quota (quantity ceiling)
- Reduces surplus, redistributes surplus