MACRO-ECONOMICS

2025 EDITION

Basic Economic Concepts

Scarcity, Choice, and Opportunity Costs

- **Scarcity** is the fundamental economic problem where resources (land, labor, capital, and entrepreneurship) are limited, but human wants are unlimited. This necessitates making choices about how resources are allocated.
- **Choice** arises because individuals, businesses, and governments must decide how to use scarce resources to satisfy the greatest number of wants and needs.
- **Opportunity cost -** is the next best alternative foregone when a decision is made. It represents the trade-off involved in making a choice.
    - Example: If a government spends money on building highways, the opportunity cost could be less spending on healthcare or education.

Production Possibilities Curve (PPC)

- The **Production Possibilities Curve (PPC)** is a graphical representation of the trade-offs an economy faces when producing two different goods.
- Assumptions:
    1. Only two goods are being produced.
    2. Resources are fixed.
    3. Technology is fixed.
    4. The economy is operating efficiently.
- **Points on the Curve:** Represent maximum efficient production.
- **Points Inside the Curve:** Represent underutilization or inefficiency.
- **Points Outside the Curve:** Are currently unattainable with available resources.
- **Shifts in the PPC:**
    - Outward shift = Economic growth (more resources, better technology).
    - Inward shift = Economic decline (loss of resources, disasters).
- **Law of Increasing Opportunity Cost:** As production of one good increases, the opportunity cost of producing additional units rises due to less adaptable resources.

Absolute Advantage, Comparative Advantage, Specialization, and Trade

- **Absolute Advantage**: A country or individual has an absolute advantage if they can produce more of a good or service using the same resources as another country or individual.

    - Example: If the U.S. can produce more wheat per acre than Canada, the U.S. has an absolute advantage in wheat production.
- **Comparative Advantage**: A country has a comparative advantage if it can produce a good at a lower opportunity cost than another country.
    - Even if a country has an absolute advantage in all goods, trade is still beneficial if each country specializes in what they have a comparative advantage in.
    - Example: If the U.S. gives up fewer cars to produce one additional unit of wheat compared to Canada, the U.S. has a comparative advantage in wheat production.
- **Specialization and Trade**:
    - Specialization leads to more efficient production and greater total output.
    - Trade allows countries to consume beyond their production possibilities.
    - The **terms of trade** determine how much of one good is exchanged for another, benefiting both parties when aligned with their comparative advantages.

Demand, Supply, and Market Equilibrium

- **Demand**: The quantity of a good or service consumers are willing and able to buy at different price levels.
    - **Law of Demand**: As the price of a good increases, quantity demanded decreases (inverse relationship).
- **Supply**: The quantity of a good or service producers are willing and able to sell at different price levels.
    - **Law of Supply**: As the price of a good increases, quantity supplied increases (direct relationship).
- **Market Equilibrium**:
    - Occurs where quantity demanded equals quantity supplied (intersection of the supply and demand curves).
    - **Surplus**: Occurs when price is above equilibrium, leading to excess supply.
    - **Shortage**: Occurs when price is below equilibrium, leading to excess demand.
    - **Shifts in Equilibrium**:
        - If demand increases (shifts right), price and quantity rise.
        - If demand decreases (shifts left), price and quantity fall.
        - If supply increases (shifts right), price falls and quantity rises.
        - If supply decreases (shifts left), price rises and quantity falls.

Determinants of Supply and Demand

- **Determinants of Demand (Shift Factors)**:
    1. **Tastes and Preferences** – Increased preference for a good increases demand.
    2. **Income** – Higher income increases demand for normal goods but decreases demand for inferior goods.
    3. **Price of Related Goods** – Substitutes (increase in price of one increases demand for the other), Complements (increase in price of one decreases demand for the other).
    4. **Expectations** – If consumers expect prices to rise, demand increases now.
    5. **Number of Buyers** – More buyers increase demand.
- **Determinants of Supply (Shift Factors)**:
    1. **Input Costs** – Higher costs decrease supply.

2. **Technology** – Advances increase supply.
3. **Taxes and Subsidies** – Taxes decrease supply, subsidies increase it.
4. **Expectations** – If firms expect higher prices in the future, they may reduce supply now.
5. **Number of Sellers** – More sellers increase supply.

Price Controls (Price Ceilings, Price Floors, and Tariffs)

- **Price Ceiling**: A legal maximum price for a good.
  - Example: Rent control in cities.
  - Effects: Causes shortages, black markets, and reduced quality of goods.
- **Price Floor**: A legal minimum price for a good.
  - Example: Minimum wage laws.
  - Effects: Causes surpluses, inefficiencies, and unemployment in labor markets.
- **Tariffs**: Taxes on imported goods.
  - Effects: Increase domestic prices, reduce imports, protect domestic industries, but can lead to trade wars.

Measurement of Economic Performance

National Income Accounts

- National income accounting is a system that measures the economic activity of a country, including income earned and output produced.
- It tracks **Gross Domestic Product (GDP)**, **Gross National Product (GNP)**, **Net National Income (NNI)**, and **Personal Income (PI)** to assess the economy's health.

Circular Flow of Income

- The **circular flow model** illustrates how money moves through an economy between **households, businesses, the government, and foreign markets**.
- It includes two main sectors:
  - **Product Market**: Where goods and services are bought and sold.
  - **Factor Market**: Where households supply land, labor, and capital in exchange for wages, rent, and profits.
- The model also includes government spending, taxation, and trade flows (exports and imports).

Gross Domestic Product (GDP)

- **GDP** is the total market value of all final goods and services produced within a country's borders in a given time period.
- Excludes intermediate goods, used goods, and financial transactions.

Components of Gross Domestic Product (Expenditure Approach)

- **GDP = C + I + G + (X - M)**
  1. **Consumption (C)**: Household spending on goods and services (largest component).

2. **Investment (I)**: Business spending on capital goods and inventories.
3. **Government Spending (G)**: Expenditures by the government on goods and services.
4. **Net Exports (X - M)**: Exports minus imports.

Real vs. Nominal GDP

- **Nominal GDP**: Measured at current prices, does not adjust for inflation.
- **Real GDP**: Adjusted for inflation, reflecting actual output growth.
- **GDP Deflator**: Used to convert nominal GDP into real GDP.
  - Formula: **Real GDP = (Nominal GDP / GDP Deflator) × 100**

Inflation Measurement and Adjustment

- Inflation is the rate at which the general level of prices increases.
- **Formula for Inflation Rate**:

$$\frac{\text{New Price Level} - \text{Old Price Level}}{\text{Old Price Level}} \times 100$$

Price Indices

- **Consumer Price Index (CPI)**: Measures the average change in prices of a fixed basket of goods and services consumed by households.
- **Producer Price Index (PPI)**: Measures wholesale price changes.
- **GDP Deflator**: Measures overall price level changes in the economy.

Nominal vs. Real Values

- **Nominal values** are measured in current prices.
- **Real values** adjust for inflation.
- **Real Interest Rate = Nominal Interest Rate - Inflation Rate**

Demand-Pull vs. Cost-Push Inflation

- **Demand-Pull Inflation**: Caused by excessive demand exceeding supply.
  - Example: Rising consumer spending leads to higher prices.
- **Cost-Push Inflation**: Caused by increased production costs (wages, raw materials).
  - Example: A rise in oil prices increases transportation costs, raising prices across industries.

Costs of Inflation

1. **Shoe Leather Costs**: Increased transaction costs as people try to avoid holding cash.
2. **Menu Costs**: Costs of updating prices frequently.
3. **Uncertainty**: Makes long-term planning difficult.
4. **Redistribution of Income**: Unexpected inflation benefits borrowers but hurts savers.

Unemployment: Definition and Measurement

- **Unemployment rate**: The percentage of the labor force that is actively seeking but unable to find work.

Formula:

$$\text{Unemployment Rate} = \frac{\text{Unemployed Workers}}{\text{Labor Force}} \times 100$$

- **Labor Force Participation Rate**: Percentage of working-age population in the labor force.

Types of Unemployment

1. **Frictional Unemployment**: Temporary unemployment due to job searching.
2. **Structural Unemployment**: Mismatch between worker skills and job requirements.
3. **Cyclical Unemployment**: Caused by economic downturns (recession).
4. **Seasonal Unemployment**: Due to seasonal demand changes (e.g., holiday jobs).

Natural Rate of Unemployment

- The unemployment rate when the economy is at full employment, consisting of **frictional and structural unemployment** but **not cyclical unemployment**.
- Estimated around **4-5%** in developed economies.

National Income and Price Determination

Aggregate Demand (AD)

- **Definition**: The total quantity of goods and services demanded across all levels of the economy at different price levels.
    - **Formula**: $AD = C + I + G + (X - M)$

    - **Consumption (C)** – Household spending.
    - **Investment (I)** – Business capital expenditures.
    - **Government Spending (G)** – Public sector spending.
    - **Net Exports (X - M)** – Exports minus imports.

Determinants of Aggregate Demand

- **Changes in Consumer Spending**:
    - Income levels
    - Consumer confidence
    - Tax policies

- **Changes in Investment Spending**:
  - Interest rates
  - Business expectations
- **Changes in Government Spending**:
  - Fiscal policy decisions
- **Changes in Net Exports**:
  - Exchange rates
  - Foreign demand for domestic goods

Multiplier and Crowding-Out Effects

- **Multiplier Effect**:
  - Describes how an initial change in spending leads to a larger overall economic impact.
  - **Formula**:

$$\text{Multiplier} = \frac{1}{1 - MPC}$$

  - **Marginal Propensity to Consume (MPC)** – Fraction of additional income that is spent.
  - Higher MPC = Stronger multiplier effect.
- **Crowding-Out Effect**:
  - Government borrowing increases interest rates, reducing private investment.
  - Occurs when fiscal expansion (increased government spending) leads to reduced private sector activity.

Aggregate Supply (AS)

- **Short-Run Aggregate Supply (SRAS)**:
  - Upward-sloping; reflects that in the short run, wages and prices are "sticky" and do not adjust immediately to changes in demand.
- **Long-Run Aggregate Supply (LRAS)**:
  - Vertical at full-employment output; reflects that in the long run, wages and prices adjust, and the economy reaches its natural level of output.

Short-Run and Long-Run Analyses

- **Short-Run**:
  - Prices and wages are slow to adjust.
  - Output can be above or below full employment.
- **Long-Run**:
  - Wages and prices fully adjust.
  - Economy moves toward full-employment output.

Sticky vs. Flexible Wages and Prices

- **Sticky Wages and Prices**:

    - Contracts and social norms prevent immediate wage adjustments.
    - Causes short-term deviations from full employment.
- **Flexible Wages and Prices**:
    - In the long run, wages and prices adjust, restoring equilibrium.

Determinants of Aggregate Supply

- **Changes in Resource Availability**:
    - Labor force growth
    - Natural resource availability
- **Changes in Technology**:
    - Innovation increases productivity.
- **Changes in Government Policies**:
    - Tax rates, regulation, subsidies.

Macroeconomic Equilibrium

- **Short-Run Equilibrium**:
    - Occurs where AD and SRAS intersect.
    - Determines the current price level and real GDP.
- **Long-Run Equilibrium**:
    - Occurs where AD intersects LRAS.
    - Economy operates at full employment.

Real Output and Price Level

- **Increase in AD** → Higher output and price levels (inflation).
- **Decrease in AD** → Lower output and price levels (deflation).
- **Increase in AS** → Lower price level, higher output.
- **Decrease in AS** → Higher price level, lower output (stagflation).

Short-Run vs. Long-Run Adjustments

- **In the Short Run**:
    - Economy may experience inflation, recession, or boom.
- **In the Long Run**:
    - Economy returns to full-employment output as wages adjust.

Actual vs. Full-Employment Output

- **Actual Output**: Current GDP level.
- **Full-Employment Output (Potential GDP)**: Output when all resources are fully employed.
- **Output Gaps**:
    - **Recessionary Gap**: Actual output < full-employment output.
    - **Inflationary Gap**: Actual output > full-employment output.

Business Cycle and Economic Fluctuations

- **Phases of the Business Cycle**:
    1. **Expansion** – GDP growth, low unemployment, rising inflation.

2. **Peak** – Maximum economic output before downturn.
3. **Contraction** – Declining GDP, rising unemployment.
4. **Trough** – Lowest point before recovery.

Financial Sector

Money, Banking, and Financial Markets

- **Money**: A medium of exchange, store of value, and unit of account.
- **Banking System**: Facilitates lending and borrowing, creating money through fractional reserve banking.
- **Financial Markets**: Markets where financial assets like stocks, bonds, and money are traded.

Definition of Financial Assets: Money, Stocks, and Bonds

- **Money**: Highly liquid asset used for transactions.
- **Stocks**: Ownership shares in a company; investors earn dividends and capital gains.
- **Bonds**: Debt securities where investors lend money to governments or corporations in exchange for periodic interest payments and principal repayment.

Time Value of Money (Present and Future Value)

- **Present Value (PV)**:

$$PV = \frac{FV}{(1+r)^t}$$

- **Future Value (FV)**: The value of an investment after earning interest over time.
  - **Formula**:

$$FV = PV \times (1+r)^t$$

  - Where **r** = interest rate, **t** = number of years.

Measures of Money Supply

- **M1**: Most liquid assets (currency, checking deposits).
- **M2**: M1 + savings accounts, time deposits, money market mutual funds.

Banks and the Creation of Money

- Banks operate under **fractional reserve banking**, where they hold only a fraction of deposits and lend out the rest.
- **Money Multiplier**: Determines the total money supply created from an initial deposit.
    - **Formula**:

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

Money Demand

- **Transaction Demand**: Money needed for everyday transactions.
- **Precautionary Demand**: Money held for unexpected expenses.
- **Speculative Demand**: Money held for investment opportunities.

Money Market

- **Short-term borrowing and lending market** where interest rates are determined by money supply and demand.
- **Money Supply Curve (MS)**: Vertical, set by the central bank.
- **Money Demand Curve (MD)**: Downward sloping; higher interest rates reduce money demand.

Loanable Funds Market

- **Market for borrowing and lending funds** (e.g., loans, bonds).
- **Supply of Loanable Funds**: Comes from savings.
- **Demand for Loanable Funds**: Comes from businesses and governments needing loans.
- **Interest Rate Determination**: Equilibrium between loan supply and demand.

Central Bank and Control of the Money Supply

- The **central bank (Federal Reserve in the U.S.)** regulates the money supply to stabilize the economy.
- Controls **monetary policy** using various tools.

Tools of Central Bank Policy

1. **Open Market Operations (OMO)**: Buying/selling government bonds to influence money supply.
    - Buying bonds → Increases money supply, lowers interest rates.
    - Selling bonds → Decreases money supply, raises interest rates.
2. **Discount Rate**: Interest rate the Fed charges banks for loans.
    - Lower rate → Increases money supply.
    - Higher rate → Decreases money supply.
3. **Reserve Requirements**: Percentage of deposits banks must hold in reserve.

- Lower requirement → Increases money supply.
- Higher requirement → Decreases money supply.

Quantity Theory of Money

- States that the money supply directly affects price levels.

- **Equation of Exchange**:

$$MV = PQ$$

  - **M** = Money supply
  - **V** = Velocity of money (how often money changes hands)
  - **P** = Price level
  - **Q** = Real GDP

Real vs. Nominal Interest Rates

- **Nominal Interest Rate**: The stated interest rate before inflation adjustment.
- **Real Interest Rate**: Adjusted for inflation, showing true borrowing costs.
  - **Formula**:

$$\text{Real Interest Rate} = \text{Nominal Interest Rate} - \text{Inflation Rate}$$

Inflation, Unemployment, and Stabilization Policies

Fiscal and Monetary Policies

- **Fiscal Policy**: Government actions involving taxation and spending to influence the economy.
  - **Expansionary Fiscal Policy**: Increases aggregate demand (AD) through higher government spending or tax cuts.
  - **Contractionary Fiscal Policy**: Decreases AD by reducing government spending or raising taxes.
- **Monetary Policy**: Central bank (Federal Reserve) actions to control money supply and interest rates.
  - **Expansionary Monetary Policy**: Increases money supply, lowers interest rates, boosts investment and AD.

    - **Contractionary Monetary Policy**: Reduces money supply, raises interest rates, slows down inflation.

Demand-Side Effects

- **Keynesian Perspective**: Focuses on increasing AD to stimulate growth.
- Expansionary fiscal and monetary policies increase consumer spending and investment.
- In the short run, increasing AD leads to higher output and employment.

Supply-Side Effects

- **Supply-Side Economics**: Focuses on boosting long-term economic growth by increasing AS.
- Policies include:
    - Reducing taxes on businesses and individuals to incentivize production.
    - Deregulation to lower costs for businesses.
    - Investment in education, technology, and infrastructure to improve productivity.

Policy Mix

- A combination of **fiscal and monetary policies** used to stabilize the economy.
- Examples:
    - During a **recession**: Expansionary fiscal and monetary policies work together.
    - During **high inflation**: Contractionary fiscal and monetary policies are used.
- Challenges:
    - Policies can sometimes work against each other (e.g., expansionary fiscal policy with contractionary monetary policy).

Government Deficits and Debt

- **Budget Deficit**: When government spending exceeds tax revenue.
- **National Debt**: The accumulation of past deficits.
- **Effects of Deficits**:
    - Can stimulate growth in the short run.
    - May lead to higher interest rates and "crowding out" private investment.
- **Debt Sustainability**:
    - Depends on a country’s ability to repay debt relative to GDP growth.

Inflation and Unemployment

- **Inflation**: A general increase in price levels.
- **Unemployment**: The percentage of the labor force actively seeking jobs.
- **Short-Run Tradeoff**: In the short run, reducing unemployment may lead to higher inflation.

The Phillips Curve: Short Run vs. Long Run

- **Short-Run Phillips Curve**: Shows an inverse relationship between inflation and unemployment.
    - Lower unemployment → Higher inflation.
    - Higher unemployment → Lower inflation.
- **Long-Run Phillips Curve (LRPC)**: Vertical at the **natural rate of unemployment**(NRU).
    - Suggests that in the long run, there is no tradeoff between inflation and unemployment.

Role of Expectations

- **Adaptive Expectations**: People base future inflation expectations on past inflation.
  - Leads to a gradual shift in the Phillips curve.
- **Rational Expectations**: People anticipate future policy changes and adjust behavior immediately.
  - This can make monetary and fiscal policy less effective.

Economic Growth and Productivity

Definition and Measurement of Economic Growth

- **Economic Growth**: An increase in the production of goods and services over time, usually measured as the percentage change in **real GDP**.
- **Formula for Growth Rate**:

$$\text{Growth Rate} = \frac{\text{Real GDP in Current Year} - \text{Real GDP in Previous Year}}{\text{Real GDP in Previous Year}} \times 100$$

- **Per Capita GDP**: GDP divided by population, showing **average income levels**.

Investment in Human Capital

- **Human capital**: Skills, knowledge, and experience that improve worker productivity.
- **Higher education, vocational training, and health care investments** boost economic efficiency and innovation.

Investment in Physical Capital

- **Physical capital**: Machinery, tools, infrastructure, and technology that enhance productivity.
- **Capital deepening**: Increasing capital per worker leads to higher economic output.

Research and Development (R&D) and Technological Progress

- **Technological progress**: Innovations that increase efficiency and productivity.
- **R&D investments** lead to new products and processes, driving **long-term economic growth**.

Growth Policy

- **Government policies**that encourage growth:
  - Investment in **education, infrastructure, and R&D**.
  - **Tax incentives** for business investment.
  - **Trade openness** to encourage competition and innovation.

Open Economy: International Finance

Balance of Payments Accounts

- A record of all economic transactions between a country and the rest of the world.
- **Composed of two main accounts**:
  1. **Current Account**
  2. **Financial Account (Capital Account)**

Balance of Trade

- **Exports > Imports** → Trade Surplus
- **Imports > Exports** → Trade Deficit

Current Account

- Records **net exports (X - M)**, net income from abroad, and net transfers.
- **Surplus** → More inflows than outflows.
- **Deficit** → More outflows than inflows.

Financial Account (Formerly Capital Account)

- Records foreign investments in domestic assets (stocks, bonds, real estate) and domestic investments in foreign assets.
- **Financial account surplus** → More foreign investment in domestic assets.
- **Financial account deficit** → More domestic investment abroad.

Foreign Exchange Market

- Determines the value of one currency relative to another.
- **Exchange rates fluctuate** based on supply and demand.

Demand for and Supply of Foreign Exchange

- **Demand for foreign currency**: When domestic consumers/importers buy foreign goods.
- **Supply of foreign currency**: When foreign consumers/importers buy domestic goods.

Exchange Rate Determination

- **Floating Exchange Rate**: Determined by market forces of supply and demand.
- **Fixed Exchange Rate**: Set by the government or central bank.
- **Managed Float**: A mix of government intervention and market forces.

Currency Appreciation and Depreciation

- **Appreciation**: A currency **gains value** relative to others.
  - **Exports become more expensive**.

    - **Imports become cheaper**.

- **Depreciation**: A currency **loses value**.
    - **Exports become cheaper**.
    - **Imports become more expensive**.

Exchange Rate Policies

1. **Fixed Exchange Rate**: Government maintains a set rate (e.g., pegging currency to the U.S. dollar).
2. **Floating Exchange Rate**: Currency value fluctuates with market forces.
3. **Managed Exchange Rate**: Central bank intervenes occasionally to stabilize fluctuations.

Inflows, Outflows, and Restrictions

- **Capital Inflows**: Foreign investment in domestic assets.
- **Capital Outflows**: Domestic investment in foreign assets.
- **Capital Controls**: Government restrictions on currency exchange and financial transactions.

Net Exports and Capital Flows

- **Net Exports (X - M)**: A component of GDP, influenced by exchange rates.
- **Capital Flows**: Movement of money across borders affects exchange rates and interest rates.

Links to Financial and Goods Markets

- **Stronger currency → Lower exports, higher imports** (negative trade balance).
- **Weaker currency → Higher exports, lower imports** (positive trade balance).
- **Interest rates and exchange rates** influence capital flows, affecting financial markets.