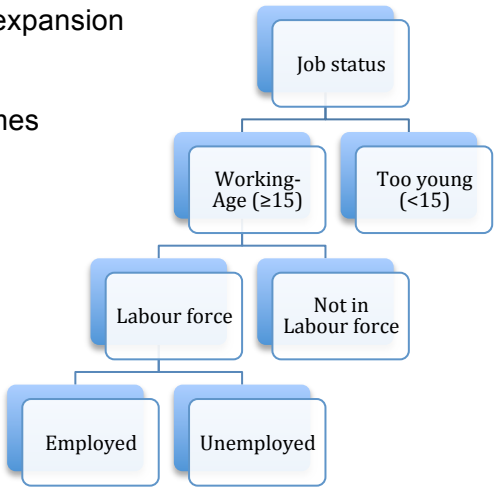
Chapter 21: Monitoring Jobs and Inflation

Employment & Unemployment

Unemployment:

- Rises in recession & falls in expansion
- Results in:
  - Lost production/incomes
  - Lost human capital



Criteria of Unemployment

Unemployed people are either:

1. Without work but has actively looked for a job within the past 4 weeks
2. Waiting to be called back after layoff
3. Waiting to start a new job within 4 weeks

Employed people have:

1. Full-time/part-time job(s)

Labour Market Indicators

$$\text{Unemployment Rate} = \frac{\#\text{ of unemployed}}{\text{labour force}} \times 100$$

(% of labour force that is unemployed)

$$\text{Labour Force Participation Rate} = \frac{\text{labour force}}{\text{working age population}} \times 100$$

(% of working-age population that is in the labour force)

$$\text{Involuntary Part Time Rate} = \frac{\text{involuntary part time workers}}{\text{labour force}} \times 100$$

(% of labour force that work part time but want full-time jobs)

$$\text{Employment to Population Ratio} = \frac{\text{employment}}{\text{working age population}}$$

(% of working-age population that is employed)

Problems with Unemployment Rate

- Rate excludes:
  - Marginally attached workers (neither working nor looking but available and want work → not included in labour force)
  - Discouraged workers (stopped looking due to repeated failures)
  - Part-time workers who want full-time jobs
- "Natural" Unemployment (always someone who doesn't have a job but is searching)

Sources and Types of Unemployment

- People become unemployed if they lose/leave their job in search for a new one OR (re)enter the labour force to look for a job
- Types of unemployment:
  1. Frictional
     - Arises from normal labour market turnover (i.e. creation/destruction of jobs)
  2. Structural
     - Created by changes in the skill set required
  3. Cyclical
     - Caused by fluctuation of business cycle

Natural Unemployment

- Full (Natural) unemployment: no cyclical unemployment/only frictional and structural unemployment

$$\text{Natural Unemployment Rate} = \frac{\text{natural unemployment}}{\text{labour force}} \times 100$$

(unemployment rate at full employment)

GDP, Price Level and Inflation

- Potential GDP: quantity of real GDP at full employment
- Output Gap = Real GDP – Potential GDP
- Price Level: average level of prices and the value of money
- Inflation Rate = %ΔCPI = %Δ price level
- Problems with Inflation:
  - Redistributes income and wealth
  - Diverts resources from production

Consumer Price Index (CPI)

- CPI: measures the average of prices paid for a "fixed" set of consumer services/goods
- CPI = 100 for base reference period

Calculating CPI:

1. Find cost of CPI basket at base-period price
2. Find cost of CPI basket at current-period price
3. Calculate CPI for current period

$$\text{CPI} = \frac{\text{Cost of Basket at Current Period}}{\text{Cost of Basket at Base Period}} \times 100$$

CPI Bias

- CPI might overstate true inflation because:
    1. New goods bias
        - New goods that weren't available in base year appear → if more expensive, results in upward bias
    2. Quality change bias
        - Part of price rise is due to improved quality & *not* inflation
    3. Commodity substitution bias
        - Changes in consumption towards cheaper goods
    4. Outlet substitution bias
        - Customers switch to buying from cheaper sources
- Bias results in:
    1. Distortion of private contracts
    2. Increased government outlays
    3. Biased estimates of real earnings
- Alternate Measures of Price Level:
    1. GDP Deflator: includes all items included in GDP
        - GDP Deflator = (Nominal GDP ÷ Real GDP) × 100
    2. Chained Price Index for Consumption: doesn't used fixed quantities
        - CPIC = (Nominal consumption expenditure ÷ Real consumption expenditure) × 100

Terminology

- Core Inflation Rate: CPI inflation rate excluding volatile elements
- Hyperinflation: rapid inflation where money loses value quickly

Chapter 22: Economic Growth

Basics of Economic Growth

- Economic Growth Rate: measurement of how rapidly total economy is expanding
- Real GDP per person: indicates standard of living
- Rule of 70: # of years for a variable to double in value is 70/(% growth rate)

Growth of Potential GDP

- Economic Growth: sustained increase in potential GDP (level of real GDP at full-employment quantity of labour)
- Aggregate Production Function (PF): relationship between real GDP and quantity of labour employed, ceteris paribus → increase in labour increases real GDP
- Aggregate Labour Market: determines quantity of labour demanded at real wage rate

$$\text{Real Wage Rate} = \frac{\text{Money Wage Rate}}{\text{Price Level}}$$

- Demand for Labour (LD): quantity of labour demanded at each real wage rate
- Supply of Labour (LS): quantity of labour supplied at each real wage rate
- Full-Employment Labour Market Equilibrium: LD = LS; real GDP = potential GDP

Reasons for Growth in GDP

- Growth in supply of labour (total # of hrs worked/population employed) caused by:
    1. Growth in average hours per worker
    2. Growth in employment-to-population ratio
    3. Growth in working-age population

  Increases in aggregate hours at equilibrium results in higher GDP since real GDP requires more time spent working & potential GDP is real GDP at full-employment
- Growth in labour productivity (real GDP/labour hours)*
    1. Physical Capital Growth
    2. Human Capital Growth
    3. Technological Advances

  More productive labour results in firms willing to pay more for *x* hours → LD increases so aggregate hours at equilibrium again increases

  *Growth Accounting: calculates contribution of capital growth and technological change to labour productivity growth

Growth Theories and Policies

1. Classical Growth Theory
    - Growth of GDP is temporary → when GDP rises above subsistence level, population explosion will eventually bring GDP per capita back to subsistence level
    - Subsistence wage rate: minimum wage rate required to maintain life
    - Problem – historical evidence indicates that population growth rate *isn't* tightly linked to income per person & population growth doesn't drive income back to subsistence levels
2. Neoclassical Growth Theory
    - Real GDP per person grows since technological change induces growth in capital per hour of labour
    - Population growth is independent of real GDP & real GDP growth rate
    - Rate of technological change influences economic growth rate but not vice versa (i.e. technological changes are by chance)

- Problem – all economies have access to same technology, suggesting economic growth rates & real GDP per capita will converge yet convergence is slow

3. New Growth Theory
    - Real GDP per capita grows indefinitely due to choices people make in pursuit of profit
    - Facts about market economies:
        1. Discoveries result from choices
        2. Discoveries bring profit and competition destroys profit
        3. Discoveries are a public capital good
        4. Knowledge *isn't* subject to diminishing returns

Suggestions for Faster Growth

- Either increase growth rate of capital per hour of labour or increase pace of technological change
    - Stimulate saving → used to finance investment, which might increase physical capital growth
    - Stimulate R&D → not all benefit of discovery goes to initial discoverer so may have under allocation of resources to R&D
    - Encourage international trade → allows extraction of all available gains from specialization and trade
    - Improve the quality of education → benefits are spread beyond person educated so tendency in under invest to this area

Chapter 23: Finance, Saving, and Investment

Terminology

- Finance vs. Money:
    - Finance: activity of providing funds for capital expenditures
    - Money: used to pay for items and make financial expenditures
- Physical vs. Financial Capital:
    - Physical Capital: tools, instruments, etc. used to produce goods & services
    - Financial Capital: funds used to purchase physical capital
- Gross Investment: amount spent on new capital
- Net Investment: change in value of capital

$$\text{net investment} = \Delta \text{ value of capital stock} = \text{gross investment} - \text{depreciation}$$

- Wealth: value of items people own

$$\Delta \text{ wealth} = \text{saving}(= \text{income} - \text{net taxes} - \text{consumption}) + \text{capital gains or loss}$$

- Saving: amount of income not spent on taxes or spent on consumption goods or services

- Capital Gain/Loss: increase/decrease in market value of assets

Financial Institutions and Financial Markets

- Three types of financial markets:
    1. Loan Markets
    2. Bond Markets
    3. Stock Markets
- Financial Institution: firm that operates on both sides of financial markets (i.e. borrower on one market and lender on another)

$$\text{Net Worth} = \text{total market value of lending} - \text{total market value of borrowing}$$

    - Net worth > 0 → solvent; net worth < 0 insolvent

$$\text{interest rate on asset} = \frac{\text{interest received}}{\text{price of asset}} \times 100$$

Loanable Funds Market

- Loanable funds market: aggregate of all financial markets
- Three Sources of Funds:
    1. Household Saving (S)
    2. Government Budget Surplus (T-G)
    3. Borrowing from the Rest of the World (M-X)
- Real vs. Nominal Interest Rate:
    - Real Interest Rate: nominal rate adjusted for inflation → approximately equal to nominal rate – inflation rate
    - Nominal Interest Rate: interest paid/received over amount borrowed/loaned, expressed as a percentage

Demand for Loanable Funds Market

- Demand for loanable funds (DLF): relationship between quantity of loanable funds demanded and real interest rate, ceteris paribus
- Quantity of loanable funds demanded depends on:
    1. Real interest rate
        - As rates increase, Q_d and amount of investment decreases; as rates decrease, Q_d and amount of investment increase
    2. Expected profit
        - As expected profit increases, Q_d and amount of investment increases; as expected profit decreases, Q_d and amount of investment decreases
- Supply for loanable funds (SLF): relationship between quantity of loanable funds supplied and real interest rate
- Quantity of loanable funds supplied depends on:
    1. Real interest rate

- As rates rise, Q_s and saving increases; as rates decrease, Q_s and saving decrease

2. Disposable Income
   - Increase in disposable income results in increase in Q_s
3. Expected future income
4. Wealth
5. Default risk

} Decreases in these factors result in increases in Q_s

- Equilibrium: $Q_s = Q_d$

Government in Loanable Funds Market

- Government enters financial loanable market when it has a surplus/deficit
  - Budget surplus increases SLF
  - Budget deficit increases DLF
- Ricardo-Barro effect:
  - Government budget has no effect on real interest rate or investment → rational investors know increases in budget deficit (surplus) result in higher (lower) future taxes → saving is adjusted & no change in real interest rate occurs
  - No crowding out (theory that budget deficit increases real interest rate & investment decreases)

Global Loanable Funds Market

- Suppliers move to markets with highest real interest rates & demanders to markets with lowest real interest rates
- International Capital Mobility:
  - Loanable funds market is a single, integrated global market
- International Borrowing and Lending:
  - National loanable funds market connects with the global market through net exports
  - Negative net exports (higher interest rate than global rate) → net borrower; positive net exports (lower interest rate than global rate) → net lender

Chapter 24 : Money, the Price Level, and Inflation

What is Money?

- **Money** is any commodity or token that is generally acceptable as a means of payment
  - Functions:
    - Medium of exchange - an object that is generally accepted in exchange for goods and services

    - Unit of account - an agreed measure for stating the prices of goods and services
    - Store of value - money can be held for a time and later exchanged for goods and services
- Money in Canada today consists of
    - Currency
    - Bank deposits
- **Currency** is the notes and coins held by individuals and businesses
- Cheques are only an instruction to banks
- Credit cards are ID cards for loans, not money
- Currency + some deposits are means of payments; other deposits are not, but have liquidity

- Official Measures of Money
    - **M1** - currency held by individuals and businesses + chequable deposits owned by individuals and businesses
    - **M2** - M1 + all other deposits—non-chequable deposits and fixed term deposits

The Banking System

The Banking System consists of

- Depository institutions
    - Chartered banks
    - Credit unions and caisses populaires
    - Trust and mortgage loan companies
- The Bank of Canada

- Banks and other depository institutions provide services for fees and earn income lending out deposits
    - Have four assets
        - Reserves (cash + deposits at Bank of Canada) – held to meet demand for currency
        - Liquid Assets (short-term government and commercial bills)
        - Securities (longer-term bonds)
        - Loans to corporations and households
- Depository institutions make profit by paying depositors low interest rates and lending at high rates in return for services for:
    - Create liquidity
    - Pool risk
    - Lower the cost of borrowing
    - Lower the cost of monitoring borrowers

- The **Bank of Canada** is the central bank of Canada
  - Supervises financial institutions, markets, payment system, and conducts monetary policy
  - Assets: government securities, loans to banks
  - Liabilities: banks notes, deposits of banks and government
- The Bank of Canada acts as a
  - Banker to the banks and government
  - Lender of last resort
  - Sole issuer of bank notes

- Monetary base (Bank of Canada notes/coins + depository institutions' deposits at the Bank)
  - Can be changed using **open market operation** – purchase or sales of government securities by Bank

Example of an Open Market Purchase
- If Bank of Canada buys government bonds
  - Increases banking system reserves
  - Increases monetary base

Example of an Open Market Sale
- If Bank of Canada sells government bonds
  - Decreases banking system reserves
  - Decreases monetary base

How Banks Create Money
- Banks create deposits when they lend out excess reserves
- The total quantity of deposits that banks can create depends on:
  - The monetary base
  - Desired reserves
  - Desired currency holding
  -
- Currency drain ratio - people desire to hold some money as currency
  - Ratio of currency to deposits
- If a bank gets a new deposit, it creates excess reserves

  Excess reserves = Actual reserves – desired reserves
- Bank loan out excess reserves
  - Borrower spends loan (and keeps some as currency), recipient of spent money deposits money into bank
- How the banking system creates money by making loans

The Money Market
- The Quantity of Money Demanded – the amount of money that people plan to hold

- The quantity of real money demanded depends on
  - The nominal interest rate
  - Real GDP
  - Financial innovations

- A rise in the price level increases the quantity of *nominal* money but doesn't change the quantity of *real* money that people plan to hold
- *Nominal money* is the amount of money measured in dollars

  Real money = Nominal money ÷ Price level
- The quantity of nominal money demanded is proportional to the price level
- The nominal interest rate makes the quantity of money demanded equal the quantity supplied
- Interest rate = opportunity cost of holding money
  - Higher interest rate decreases the quantity of real money demanded
  - The Demand for Money is the relationship between the quantity of real money demanded and the nominal interest rate, holding constant other factors
- Demand for money curve
  - A rise in the interest rate brings a decrease in the quantity of real money demanded
  - A fall in the interest rate brings an increase in the quantity of real money demanded

Shifts in the Demand for Money Curve

- A decrease in real GDP or a financial innovation decreases the demand for money and shifts the demand curve left
- An increase in real GDP increases the demand for money and shifts the demand curve right
- Money market equilibrium occurs when the quantity of money demanded equals the quantity of money supplied
  - Short-run equilibrium is determined by the quantity of money supplied (actions of banks and the Bank of Canada)
  - Changes in interest rate create a new equilibrium in the money market
- When the Bank of Canada increases the supply of money, the nominal interest rate falls (the short-run effect)
- When the Bank of Canada increases the supply of money, the price level rises and the nominal interest rate returns to its initial level (the long-run effect)
- In the long-run, supply and demand of loanable funds determines real interest rate

  Nominal interest rate = real interest rate + expected inflation rate

The Quantity Theory of Money

The **quantity theory of money** is the proposition that, in the long run, money growth and inflation move up and down together

- Velocity of circulation *V*, the price level *P*, real GDP *Y,* and the quantity of money *M:*

  V = PY ÷ M

- The *equation of exchange*

  MV = PY
  - The equation of exchange becomes the quantity theory of money if *M* does not influence *V* or *Y*
  - So in the long run, the change in *P* is proportional to the change in *M*

- Expressing the equation of exchange in growth rates:

Money growth rate + Rate of velocity change = Inflation rate + Real GDP growth

- In the long run, velocity does not change, so

  Inflation rate = Money growth rate – Real GDP growth

Chapter 25: The Exchange Rate and the Balance of Payments

The Foreign Exchange Market

- **Foreign currency -** foreign bank notes, coins, and bank deposits
  - Obtained in exchange for domestic currency in the **foreign exchange market**
- An exchange rate is the price—the price of one currency in terms of another
  - A fall in the value of one currency in terms of another currency is called **currency depreciation**
  - A rise in value of one currency in terms of another currency is called **currency appreciation**

Demand and supply in the foreign exchange market determine the exchange rate

- Demand in the Foreign Exchange Market (planned amount to buy at a given price) depends on

  1. The exchange rate
  2. World demand for Canadian exports
  3. Interest rates in the United States and other countries
  4. The expected future exchange rate

  The Law of Demand for Foreign Exchange

- Other things remaining the same, the higher the exchange rate, the smaller is the quantity of Canadian dollars demanded in the foreign exchange market
  - Movement along the demand curve

The demand curve for Canadian dollars shifts right
- If world demand for Canadian exports increases
- If the Canadian interest rate differential increases
- If the expected future exchange rate increases

- Supply in the Foreign Exchange Market (planned amount to sell at a given price) depends on

1. The exchange rate
2. Canadian demand for imports
3. Interest rates in Canada and other countries
4. The expected future exchange rate

The Law of Supply of Foreign Exchange
- Other things remaining the same, the higher the exchange rate, the greater is the quantity of Canadian dollars supplied in the foreign exchange market
  - Movement along the supply curve

The supply curve of Canadian dollars shifts left
- If Canadian demand for imports decreases
- If the Canadian interest rate differential increases
- If the expected future exchange rate increases

Demand and supply in the foreign exchange market determine the exchange rate
- If the exchange rate is too high, a surplus of Canadian dollars drives it down
- If the exchange rate is too low, a shortage of Canadian dollars drives it up
- The market is pulled to the equilibrium exchange rate at which there is no shortage or surplus

The **real exchange rate** is the relative price of Canadian-produced goods and services to foreign-produced goods and services

Nominal exchange rate (*E*), Real exchange rate (*RER*), *P* is the Canadian price level, *P** is the Japanese price level

$$RER = (E \times P)/P^*$$

The Short Run
- If the nominal exchange rate changes, *P and P** do not change and the change in *E* brings an equivalent change in *RER*

$$RER = (E \times P)/P^*$$

The Long Run

- *RER* is determined by the real forces of demand and supply in the markets for goods and services
- The nominal exchange rate and price levels are determined together, and the real exchange rate doesn't change

$$E = RER \times (P^*/P)$$

Exchange Rate Policies

- **Flexible exchange rate** – exchange rate is determined by supply and demand, changes in interest rates influence exchange rate
- **Fixed exchange rate** – policy pegs the exchange rate at a target value – if change the exchange rate, Bank of Canada must buy/sell Canadian dollars to change demand/supply – works only as long as foreign currency reserves last
- **Crawling peg** – policy intervenes to meet selected target path for the exchange rate

Chapter 26: Aggregate Supply and Aggregate Demand

Aggregate Supply

- The *quantity of real GDP supplied* is the total quantity that firms plan to produce during a given period
- Aggregate supply is the relationship between the quantity of real GDP supplied and the price level
- Quantity of real GDP supplied depends on quantities of labour, physical and human capital, state of technology
  - Only quantity of labour can vary (at a given time)
  - Labour market can be at full employment, above full employment, or below full employment
  - Potential GDP is the quantity of real GDP supplied at full employment
- **Long-Run Aggregate Supply (LAS)** - the relationship between the quantity of real GDP supplied and the price level when real GDP equals potential GDP
  - Potential GDP is independent of the price level
  - LAS curve is vertical at potential GDP
  - LAS shifts to the right when potential GDP increases due to the increase in full employment quantity of labour, increase in capital stock, and technological advance
- **Short-Run Aggregate Supply (SAS)** - the relationship between the quantity of real GDP supplied and the price level when the money wage rate, the prices of other resources, and potential GDP remain constant
  - A rise in the price level with no change in the money wage rate and other factor prices increases the quantity of real GDP supplied

  - SAS curve is upward sloping
- *LAS* curve
  - In the long run, the quantity of real GDP supplied is potential GDP
  - As the price level rises and the money wage rate change by the same percentage
  - The quantity of real GDP supplied remains at potential GDP

- In the short run, the quantity of real GDP supplied increases if the price level rises
- The *SAS* curve slopes upward
- A rise in the price level with no change in the money wage rate induces firms to increase production

- Aggregate supply changes if an influence on production plans other than the price level changes
  - Changes in potential GDP
  - Changes in money wage rate (and other factor prices)
  - Increase in potential GDP
  - The *LAS* curve shifts rightward and the *SAS* curve shifts along with the *LAS* curve

- Rise in the money wage rate
  - Short-run aggregate supply decreases and the *SAS* curve shifts left
  - Long-run aggregate supply does not change

Aggregate Demand

- **Aggregate demand (AD)** – total quantity of real GDP demanded (the total amount of final goods and services produced in Canada that people, businesses, governments, and foreigners plan to buy) at a given price level
  - Consumption expenditures, *C*, investment, *I*, government expenditure, *G*, net exports, *X – M*

$$Y = C + I + G + X - M$$

  - Buying plans depend on
    - The price level
    - Expectations
    - Fiscal policy and monetary policy
    - The world economy
  - Increase in price decreases quantity of real GDP demanded, movement up along the AD curve
    - Wealth and Substitution Effect
  - A change in any influence on buying plans other than the price level changes aggregate demand (shift)

Changes in aggregate demand

- When aggregate demand increases, the *AD* curve shifts right
- When aggregate demand decreases, the *AD* curve shifts left

AD increases

- If fiscal policy cuts taxes (increases disposable income) or increases government expenditure
- If monetary policy decreases interest rates or increases quantity of money
- If exchange rate decreases or foreign income increases
- If expectations of future disposable income, future inflation or future profits increase

Explaining Macroeconomic Trends and Fluctuations

- **Short-Run Macroeconomic Equilibrium** occurs when the quantity of real GDP demanded equals the quantity of real GDP supplied (where *AD* = SAS)
  - Short-run equilibrium is the normal state of the economy, and occurs at each point in time along the path to long-run equilibrium
- **Long-Run Macroeconomic Equilibrium** occurs when real GDP equals potential GDP (where AD = SAS = LAS)
  - Long-run equilibrium is the state toward which the economy is heading

Short-run equilibrium

- If real GDP is above equilibrium GDP, firms decrease production and lower prices
- If real GDP is below equilibrium GDP, firms increase production and raise prices
  - These changes bring a movement along the *SAS* curve towards equilibrium
- In short-run equilibrium, real GDP can be greater than or less than potential GDP

- Economic Growth: the *LAS* curve shifts right due to increase in labour, capital, and technological advances
- Persistent inflation occurs when AD grows faster than LAS – quantity theory of money: money supply growth is the most likely source

- The Business Cycle
  - Short-run equilibrium may occur at
    - **Above full-employment equilibrium** is an equilibrium in which real GDP exceeds potential GDP
      - **Inflationary Gap -** the amount where potential GDP > real GDP
    - A **full-employment equilibrium** is an equilibrium in which real GDP equals potential GDP
    - A **below full-employment equilibrium** is an equilibrium in which potential GDP exceeds real GDP
      - **Recessionary Gap -**when real GDP < potential GDP

  - As the economy moves from one type of short-run equilibrium to another, real GDP fluctuates around potential GDP in a business cycle

- Economy fluctuates in the short-run because of fluctuations in AD and SAS
- If AD increases so the quantity of real GDP supplied > potential, the economy does not stay in above full-employment equilibrium – upward pressures on the money wage rate shifts SAS left toward long-run equilibrium
- If resources prices increase so SAS shifts left and the quantity of real GDP supplied < potential, then **stagflation** results (inflation and falling real GDP)

Macroeconomic Schools of Thought

Macroeconomists have different views about business cycles and can be divided into:

The Classical View

- A **classical** macroeconomist believes that the economy is self-regulating and always at full employment
- A **new classical** view is that business cycle fluctuations are the efficient responses of the economy to uneven technological change

The Keynesian View

- A **Keynesian** macroeconomist believes the economy is rarely at full employment and needs active monetary and fiscal policy
- **New Keynesian** economists agree with Keynesians that money wage and other prices of goods are sticky

The Monetarist View

- A **monetarist** is a macroeconomist who believes that the economy is self-regulating and that it will normally operate at full employment, provided that monetary policy is not erratic and that the pace of money growth is kept steady