Chapter 35.2-4 → The Foreign Exchange Market

- Balance of payments account: records of transactions between Canada and the rest of the world
    - Ex. Imports/exports, sale/purchase of assets
- Credit: receipt for Canada (ie. Sale of a product or asset to foreigners)
- Debit: represents a payment for Canada
- *Current Account:* records transactions from trade in goods and services
    - Trade Account: payments and receipts from imports/exports
    - Capital-Service Account: payments and receipts from income on assets
- *Capital Account:* records international transactions in assets
    - Financial capital inflow (credit)/outflow (debit)
- Balance of Payments = Current Account + Capital Account = 0
- Exchange rate: the Canadian-dollar price for one unit of foreign currency
    - ? CAD/$1 USD
- Appreciation = ↓ in exchange rate
- Depreciation = ↑ in exchange rate
- **Demand** for foreign currency (ie. Euro) = **supply** of CAD
- **Supply** for foreign currency (ie. Euro) = **demand** for CAD
- Supply of Foreign Exchange: (demand for CAD)
    - Canadian Exports
    - Asset Sales (capital inflows)
    - Reserve Currency
- Flexible exchange rate = no central bank intervention
- Fixed exchange rate = pegged at particular rate
- Adjustable peg = fix specific values, understand controllable situations
- Changes in flexible exchange rate
    - Increase in world price of CAN exports = appreciation
    - Rise in price of CAN imports = depreciation
    - CAN inflation > other countries = depreciation
    - CAN inflation < other countries = appreciation
    - Contractionary monetary policy → rise in interest rates → capital inflow → appreciation
    - Expansionary monetary policy → reduction in interest rates → capital outflow → depreciation

Chapter 19→ Intro to Macro

- Nominal national income: measured in **current** dollars
- Real national income: measured in **constant** dollars (base-period)
- Potential output (Y*)

- Actual output
- Output Gaps:
    - Recessionary
    - Inflationary
- National income is an important measure of **economic performance**
- *Real per capita* national income is an important determinant of improvements in a society's standard of living
- Unemployment Rate = Unemployed/Labour Force
- Types:
    - Frictional: natural turnover (between jobs)
    - Structural: mistake in location or skills
    - Cyclical: involuntary (due to output gap ie. boom/recession)
- Labour productivity: GDP/employment
- Inflation: rise in average off ALL prices
- CPI: average prices of goods and services commonly bought by consumers
- Rate of Inflation = Δ in price level/initial price level (%)
- Interest rate: price paid per dollar borrowed
    - Nominal: price paid per dollar borrowed per period of time
    - Real: nominal – inflation
- **Burden of borrowing** depends on the real interest rate

Chapter 20→ National Income

- Intermediate goods: used as inputs by other producers
- Finals goods: ready for sale
- Valued added: value of firms output – cost of inputs purchased from other firms
- GDP from the expenditure side:
    - Consumption
    - Investment (Net = gross – depreciation)
    - Government purchases
    - Net exports (exports – imports)

$$\mathbf{GDP = C_a + I_a + G_a + (X_a - IM_a)}$$

- GDP from the income side:
    - Factor incomes
        - Wages + salaries
        - Interest
        - Business profits
        - Net domestic income
    - Non-factor payments
        - Indirect taxes less subsidies

    - Depreciation

GDP = factor incomes + (indirect taxes – subsidies) + depreciation

- GNP: value of total incomes earned by domestic residents
- Disposable personal income: available to spend/save
- GDP deflator = GDP at current prices/GDP at base-period prices
  = Nominal GDP/real GDP

Chapter 21→ Short Run Model

- Desired aggregate expenditure (AE): sum of desired spending on domestic output

  AE = C + I
    - Autonomous: do not change with NI
    - Induced: affected by changes in NI
- Consumption: (affected by)
    - Disposable income
    - Wealth
    - Interest rates
    - Expectations about the future

C = Desired Consumption + MPC (Y_D)

- Average propensity to consume (APC) = C/Y_D
- Marginal propensity to consume (MPC) = $\Delta C/ \Delta Y_D$ (slope)
- 45° line: desired consumption = disposable income
- Average propensity to save (APS) = S/Y_D
- Marginal Propensity to Save (MPS) = $\Delta S/ \Delta Y_D$
- APC + APS = 1 … MPC + MPS = 1
- Shifts of the consumption function:
    - Change in household wealth
    - Change in interest rates
    - Change in expectations
- Desired investment expenditure
    - Inventory accumulation
    - Residential construction
    - New plant and equipment
- Changes in equilibrium national income (AE = Y)
    - Upward shift in AE function
        - Rise in amount of desired AE at each level
    - Downward shift in AE function
        - Fall in amount of desired AE at each level
    - Increase in marginal propensity to spend (z) steepens AE curve
        - Increases NI

- Decrease in marginal propensity to spend (z) flattens AE curve
  - Decreases NI

- Simple multiplier = ΔY/ΔA = 1/1 – z

Chapter 22→ Government &Trade

- Fiscal policy: use of government taxes and spending
- Net tax revenue: total tax revenue – transfer payments (T)
- Net tax rate: income in net tax revenue generated when NI rises by one dollar

T = tY

- Budget balance = T – G

** All levels of government**

- Net Imports: IM = mY
- Net Exports: NX = X – mY
  - m = marginal propensity to import
- Shifts in Net Export Function:
  - Changes in foreign income
    - (+)vely affect exports
  - Changes in international relative prices
    - Rise = decrease exports, increase imports (NX ↓)
    - Fall = rise exports, increase imports (NX ↑)
- Y_D = Y – T

C = c + MPC x Y_D
I
G
T = tY
X
IM = mY

C = MPC (1 – t) Y

AE = [c + I + G + X] + [MPC (1 – t) – m] Y

- z = MPC(1 – t) – m
- The multiplier:
  - Without government and foreign trade
    - Simple multiplier = 1/ 1 – MPC
  - With government and foreign trade
    - 1/1 – [MPC (1 – t) – m]
- The higher the marginal propensity to import, the lower the simple multiplier

Chapter 23→ Output & Price in the Short Run

- Exogenous changes in price level
    - Changes in consumption
        - Rise in price level lowers purchasing power
    - Changes in net exports
        - Rise in domestic price level shifts net export function downwards → downward shift of AE curve
- Shifts in the aggregate demand curve (shocks)
    - Change in government policy (purchases/taxation)
    - Change in households consumption
    - Firms investment behaviour
    - Foreigners demand for CAN exports
- The aggregate supply curve
    - Assumptions:
        - State of technology is constant
        - Prices of all factor prices are constant
- Shifts in the aggregate supply curve
    - Changes in input
        - Changes in factor prices (exogenous/endogenous)
    - Changes in production technology
        - Deterioration/improvements in technology
- A variable price level reduces the value of the multiplier
- The steeper the AS curve, the greater the price effect ad small the output effect (vice versa)

Chapter 24→ The Adjustment of Factor Prices

	The Short Run	The Adjustment Process	The Long Run
Key Assumptions	1. factor prices are exogenous 2. technology and factor supplies are constant/exogenous	1. factor prices are flexible/endogenous 2. technology and factor supplies are constant/exogenous	1. factor prices are fully adjusted/endogenous 2. technology and factor supplies are changing
What Happens	Y is determined by AD and AS	Factor prices adjust to output gaps. Y eventually returns to Y*.	Y* grows over the long run.
Why We Study This State	To show the effects of AD and AS shocks on Y	To see how output gaps cause factor prices to change and why Y tends to return to Y*.	To understand the nature of long-run economic growth.

- Output above potential, Y > Y*
    - High profits for firms
    - Excess demand for labour
    - Wages (and other factor prices) rise
- Output below potential, Y < Y*
    - Low profits for firms
    - Excess supply of labour
    - Wages (and other factor prices) fall
- Downward wage stickiness
- The Phillips curve
    - Observed that wages tended to fall in periods of high unemployment (vice versa)
    - Relates wage changes to the level of unemployment
- The level of Y* acts like an anchor for the economy
- Expansionary AD shocks (+)
    - First raises prices and output along the AS curve
    - Then induces a shift of the AS curve, further raises prices
    - Lowers output along new AD curve
    - Eventually eliminates any boom caused by shock

- Contractionary AD shocks (-)
    - First lowers price level and GDP along AS curve
    - Induces a (possibly slow) shift of AS curve, further lowers prices
        - Sticky wages vs. flexible wages
    - Raises output along new AD curve
    - Eventually eliminates a recessionary gap
- Aggregate supply shocks
    - Negative AS shock caused by increase in input prices
    - Causes Y to fall and price level to rise
    - Adjustment process then reveres the AS shift
    - Returns economy to starting point
    - Vice versa for positive AS shock
- Fiscal policy stabilization
    - Closing a recessionary gap
        - Government can use expansionary fiscal policy to shift AD curve to the right
            - Reducing taxes
            - Increasing transfers
            - Increasing level of government purchases
    - Closing an inflationary gap
        - Government can use contractionary fiscal policy to shift AD curve to the left
            - Increasing tax
            - Reducing transfers
            - Reducing level of purchases
- Government intervention speeds up economy's natural adjustment process
- Paradox of thrift: an increase in savings reduces the level of Y (in the SR).
    - Policy implication may cause a major and persistent recession and prolonged inflation
- In the LR, Y is determined by Y*. The increase in savings has the long run effect of increasing investment and therefor increasing Y*.
- Automatic stabilizer: the government's tax-and transfer system
- Simple multiplier = 1 / (1 – z)
- The lower the net tax rate, the larger the simple multiplier
    - Y response is less stable to shocks
- Decision lag
- Execution lag
- Fine tuning: maintain output at Y* by frequent changes in fiscal/monetary policy

- Gross tuning: use of macro policy to stabilize economy to avoid large deviations from Y*
- In short run, fiscal expansion created by an increase in G will increase Y
- In the long run, the rise of G may "crowd out" private spending
    - The growth rate of Y* may be reduced
- In the short run, fiscal policy via the reduction of taxes increases Y
- In the long run, the tax reduction leads to more investment and work effort
    - There will be a positive effect on the level and growth rate of Y*

Chapter 25 → Short Run vs. Long Run

- Changes in economic activity distinguished by behaviour of real GDP over time
- Short run changes in GDP involve primarily opening/closing of **output gap**
- Long run changes in GDP involve **change in Y***, little/no change in output gap

$$GDP = F\ (F_E/F) \times (GDP/F_E)$$

F = factor supply
F_E/F = factor utilization rate
GDP/F_E = productivity

- Any change in GDP can be decomposed into a change in one of these^ factors
- Long Run:
    - Factor Supply
        - Labour
        - Capital
    - Productivity
- Short Run:
    - Factor utilization
        - Fluctuates in response to AD and AS shocks
- Fiscal and monetary policies affect short run level of GDP by altering the level of demand and the position of the AD curve
- Unless these policies are able to affect Y*, they will have no long run effect on GDP

Chapter 26 → Long Run Economic Growth

- Three variables affecting long run economic growth:
    - Real GDP
    - Per capita GDP
    - Real GDP per employed worker
- Benefits:

  - Rising average living standards
  - Address poverty and income equality
- Costs:
  - Forgone consumption
  - Firms made obsolete
  - Products become obsolete
  - Existing skills become obsolete
- Sources:
  - Growth in labour force
  - Growth in human capital
  - Growth in physical capital
  - Technological improvement
- Theories of Economic Growth:
  - Investment, Saving, and Growth
    - Equilibrium interest rate is determined where desired national saving equals desired investment

$$\text{Private Saving} = Y^* - T - C$$
$$\text{Public Saving} = T - G$$
$$\text{National Saving} = Y^* - C - G$$

G = gov't purchases
T = taxes net of transfers
C = desired consumption

    - For a given level of real GDP in the long run, an increase in household consumption or government purchases must imply a reduction in national savings
    - Increase in interest rate → decrease in consumption
    - Decrease in interest rate → increase in investment
    - Increase in NS reduces real interest rate and encourages investment
    - A higher the rate of investment leads to a higher future growth rate of Y*
    - Increase in demand for investment pushes up real interest rate and encourages more saving
    - Higher rate of saving leads to higher growth rate of Y*
  - Neoclassical Growth Rate
    - Aggregate production function
    - Relates the economy's total output to total amount of factors used to produce output

$$GDP = F_T(L, K, H)$$

        - For a given state of technology, changes in either L, K, or H will lead to changes in GDP
        - Diminishing marginal returns
        - Constant returns to scale
    - Endogenous Technological Change
        - In Neoclassical: innovation increases the amount of output producible from a given level of factor inputs (exogenous)
        - Technological change in responsive to such economic signals as prices and profits (endogenous)
        - Learning by doing
        - Knowledge transfer
        - Market structure and innovation
        - Shocks and innovation
    - Increasing Marginal Returns
        - As investment in some new geographical area, new product, or new technology proceeds through time, new increments of investment are often more productive than previous increments
        - Market-development costs
        - Knowledge (unlimited potential)
- Limits to growth:
    - Resource exhaustion
    - Environmental degradation

Chapter 27 → Money and Banking

- Gresham's law: debased (bad) money drives undebased (good) money out of circulation
- Central bank: acts as banker to commercial banker and government
    - Regulator of money supply
    - Supports financial markets
- Commercial banks: privately owned
    - Provision of credit
    - Interbank cooperative relationships
    - Make profits
    - Keep reserves, sufficient cash on hand to meet daily demands
        - Fractional-reserve system
        - (Target) reserve ratio
        - Excess reserves
- Creation of deposit money:
    - Cash that is new to the commercial banking system

- Money brought to Canada by an immigrant
- Cash from under bed/safety deposit box
- Cheque from bank of Canada

$$\Delta \text{ Deposits} = \text{new cash deposits}/v = \Delta \text{ Reserves}/v$$

v = target reserve ratio

- A new deposit will increase the total amount of deposits by $1/v$ times
- The larger is the cash drain from the banking system, the smaller will be the total expansion of deposits created by anew cash deposit

$$\Delta \text{ Deposits} = \text{new cash deposits}/c + v$$

- Realistic value for cash-deposit ratio in Canada is 5%
- Money supply is the total amount of money in the economy at a point in time

Money Supply = Currency + Bank Deposits

- Kinds of deposits
  - Demand
  - Savings
  - Term
- Definitions of money supply
  - M1: currency in circulation + demand deposits held at chartered banks
  - M2: currency in circulation + demand and term deposits at chartered banks
  - M2+: includes M2 + similar deposits at other financial institutions (ie. Trust/mortgage loan companies, credit unions, caisses populaires) and holdings of money-market mutual funds
- Near money: liquid assets, highly convertible in money without risk of significant loss of value
- Money substitutes: serves as medium of exchange but is not a store of value

Chapter 28 → Money, Interest Rates, and Economic Activity

- Treasury bills and bonds: IUOs issued by the gov't or corporations
- Present value (PV): the value now of one or more payments or receipts made in the future

$$PV = \frac{R_1}{1+i} + \frac{R_2}{(1+i)^2} + \cdots + \frac{R_T}{(1+i)^T}$$

- The PV of any bond that promises a future payment or sequence of future payments is negatively related to the market interest rate
- A bond's equilibrium market price will be equal to its present value
- Increase in i → fall in price of bond → increase in bond yield

- Increase in bond riskiness → decline in expected PV → decrease in bond price (higher yield)
- Reasons for holding money:
    1. Transactions demand
    2. Precautionary demand
    3. Speculative demand
- Determinants of money demand:
    - Interest rate (Negatively related)
    - Real GDP (positively related)
    - Price level (positively related)

$$M_D = M_D(\overset{-}{i}, \overset{+}{Y}, \overset{+}{P})$$

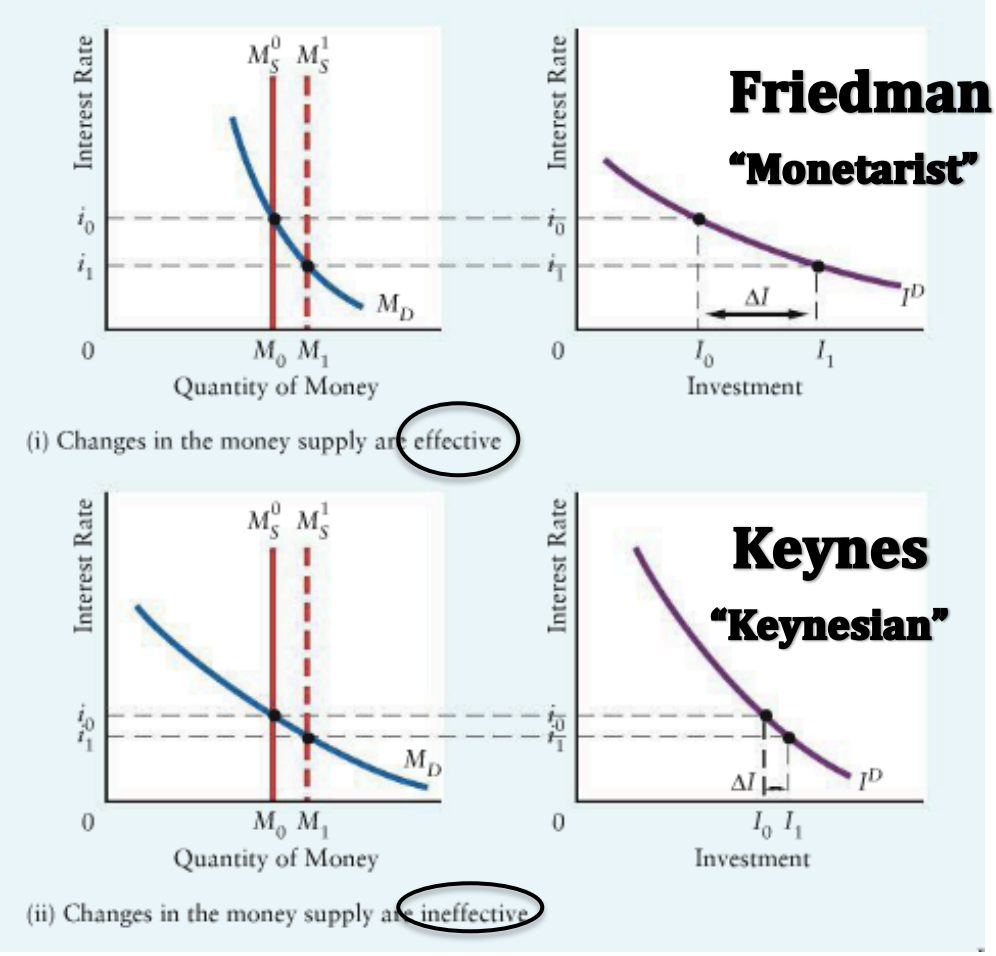
- ↑ interest rate ↑ opportunity cost of holding money ↓ quantity money demanded
- ↑ real GDP ↑ volume of transactions ↑ quantity money demanded
- ↑ price level ↑ dollar value of given volume of transactions ↑ quantity money demanded
- Monetary equilibrium: quantity of money demanded = quantity of money supplied
- Determined by interest rate
- Monetary transmission mechanism: connection between changes in demand and supply of money and the level of aggregate demand
    1. **Δ** in S of/D for money → **Δ** in i^* in SR
    2. **Δ** i → **Δ** desired I and C (and NX in open economy)
    3. **Δ** desired AE → a shift in AD curve and SR **Δ** real GDP and price level
- Changes in interest rate:

↑ money supply ⇒ excess supply of money at initial interest rate
⇒ firms and households buy bonds
⇒ ↑bond prices
⇒ ↓equilibrium interest rate

↑ money demand ⇒ excess demand for money at initial interest rate
⇒ firms and households sell bonds
⇒ ↓bond prices
⇒ ↑equilibrium interest rate

- Changes in desired investment and consumption:
    - ↓ interest rate ↓ opportunity cost of borrowing or using retained earnings of investment purposes
    - ↓ interest rates lead to ↑ desired investment expenditure

- Changes in aggregate demand:
  - ↑ in money supply ↓ interest rate and ↑ desired investment causes a rightward shift of AD curve
  - ↓ in money supply ↑ interest rate and ↓ desired investment causes a leftward shift of AD curve
- In an open economy with capital mobility, an increase in money supply is predicted to cause an increase in aggregate demand
  - Reduction in interest rates causes interest in investment
  - Lower interest rates cause capital outflow, depreciation, rise in NX
- Long run money neutrality (Y* unaffected by changes in supply of money)
- Hysteresis effect: the proposition of LR money neutrality is debatable
  - A change in money supply, via effect on interest rate, can affect the course of investment and technological change and path of Y*
- The steeper the M_D curve, the more interest rates will change in response to a given change in the money supply
- The flatter the I^D curve, the more investment expenditure will change in response to a given change in the interest rate, and hence the larger shift in the AD curve



Chapter 29 → Monetary Policy in Canada

- Two approaches for implementing monetary policy:
    1. Target money supply
    2. Target interest rate
- Disadvantages:
    - Cannot control process of deposit creation
    - Uncertainty regarding slope of M_D curve
    - Uncertainty regarding position of M_D curve
- Advantages:
    - Able to control particular interest rate
    - Uncertainty about slope and position of M_D curve does not prevent Bank of Canada from establishing desired interest rate
    - Can easily communicate it's interest rate policy to the public
- Overnight interest rate: commercial banks charge one another for overnight loans
    - By influencing the overnight rate, the Bank of Canada also influences longer term interest rates relevant to consumption and investment
- Bank rate: rate Bank of Canada charges commercial banks for loans (0.25 percentage points above target rate)
- Expansionary policy: reducing interest rate
    - Stimulate aggregate demand
- Contractionary policy: increase interest rate
    - Reduce aggregate demand/growth rate
- High inflation is costly
- Monetary policy is the cause of sustained inflation
- Inflation targeting (2%)
- Persistent output gaps create pressure for rate of inflation to change
- Monetary policy implemented to keep inflation around 2% target and real GDP close to Y*
- Inflation targeting = stabilizing policy
- Complications in inflation targeting:
    - Volatile food and energy prices (core inflation vs. CPI inflation)
    - Changes in exchange rate (causes)
- Lags:
    - Changes in expenditure take time
    - The multiplier effect takes time
    - May cause monetary policy to be destabilizing

Chapter 30 → Inflation and Disinflation

- inflation: the rise in the average of all prices

- Wages and the output gap
    - Excess demand for labour associated with inflationary gap puts upward pressure on nominal wages
    - Excess supply of labour associated with recessionary gap puts downward pressure on nominal wages (adjustment slow)
    - Absence of output gap implies demand forces not exerting pressure on nominal wages
- Expectation of specific inflation creates pressure for nominal wages to rise by that rate (rational expectations)

Changes in Nominal Wages = Output Gap Effect + Expectational effect

- the net effect of output gaps and inflation expectations acting on wages determines what happens to the AS curve

Actual Inflation =
Output Gap Inflation + Expected Inflation + Supply Shock

- In the absence of supply shocks, if expected inflation equals actual inflation, real GDP must be equal to Y*
- Constant inflation with Y = Y* occurs when:
    - The rate of monetary growth
    - The rate of wage increase
    - And the expected rate of inflation
- Are all consistent with the actual inflation rate
- Demand shocks: rightward shift of AD curve (creates inflationary gap)
    - Causes:
        - Reduction in tax rates
        - Increase in autonomous expenditure (I, G, NX)
        - Expansionary monetary policy
- AD shock not validated produces temporary inflation, economy's adjustment process eventually restores Y* and stable prices
- Validation produces sustained inflation fuelled by monetary expansion
- Supply shocks: leftward shift of AS curve (not caused by excess demand in markets for factors of production)
    - Causes:
        - Rise in cost of imported raw materials
        - Rise in domestic wages not due to excess demand in labour market

- Validation of negative supply shock causes initial rise in price level followed by further rise, resulting in higher price level but much faster returns to Y* then automatic stabilizers
- Acceleration hypothesis: when real GDP is held above Y*, the persistent gap will cause inflation to accelerate
- Phillips Curve: the relationship between unemployment and the rate of increase of nominal wages that arises when the output gap and expectations components of inflation are combined
- Disinflation: a reduction in the rate of inflation
    1. Removing monetary validation
        - Tightening monetary policy via raising interest rates
    2. Stagflation
        - How quickly inflation expectations are revised
    3. Recovery
        - The return to Y*
- Cost of disinflation: the loss of output that is generated in the process

Chapter 31 → Unemployment Fluctuations & The NAIRU

- changes un unemployment:
    - rapid economic growth: falls
    - periods of slow growth: rises
- amount of activity in labour market better reflected by the flows into and out of unemployment
- consequences of unemployment:
    - lost output
    - personal costs
- Unemployment fluctuations:
    - Marketing-clearing theories: assume real wages always adjust to clear the labour market
        - There is no involuntary unemployment
    - Non-Market-Clearing Theories: labour markets do not operate in extreme manners
        - Wage stickiness
- Types of unemployment (affecting the NAIRU)
    - Frictional: normal turnover
    - Structural: mismatch in skills, location, industry
- Changes in the NAIRU:
    - Demographic shifts
    - Hysteresis
    - Globalization and structural change

  - Policy and labour market flexibility
- Reducing Unemployment:
  - Cyclical
    - Countered by monetary or fiscal policy
  - Frictional
    - Inevitable
    - Employment insurance
  - Structural
    - Resisting change (preserving existing jobs vs. reallocating resources where they are most valuable)
    - Assisting adjustment (subsidizing training/education)
    - Improve labour market information flow

Chapter 32 → Government Debt and Deficits

- government budget constraint:

$$\text{Government Expenditure} = \text{Tax revenue} + \text{Borrowing}$$

- debit-service payments: represent interest owed on current stock of debt

$$(G + iD) - T = \text{Borrowing}$$

- budget deficit: excess gov't expenditure over tax revenues in a given year
- government debit: outstanding stock of financial liabilities

$$\text{Budget Deficit} = \Delta D = (G + iD) - T$$

- primary budget deficit: difference between the gov't's overall budget deficit and its debit-service payments

$$\text{Primary budget deficit} = G - T$$

- when considering the sixe and effects of budget deficits or surpluses, it is important to consider all levels of gov't
- the budget deficit function: to see why the budget deficit can rise or fall even when there is no change in fiscal policy
- ↑ real GDP ↓ budget deficit (vice versa)
- changes in real GDP lead to movements along a given budget deficit function
- expansionary change in fiscal policy increases the cyclically adjusted deficit
- a contractionary change in fiscal policy reduces the cyclically adjusted deficit
- debt dynamics:
- if $r = g$, reductions in d require government to run primary budget surpluses

$$\Delta d = x + (r - g) \times d$$

d = debt-to-GDP ratio
x = government's primary budget deficit
r = real interest rate
g = growth rate of real GDP
Δd = change in debt-to-GDP ratio

- Investments in closed economies
    - ↑ budget deficit ↓ in supply of national saving
    - ↓ NS ↑ equilibrium interest rate ↓ investment
    - SR: fiscal expansion shifts AD to the right, ↑ real GDP
    - LR: real GDP returns to Y* at an ↑ interest rate
- Net exports in open economies
    - ↑ interest rates ↑ capital inflow
    - ↑ capital inflow ↑ demand for CAD ↑ appreciation
    - if appreciation is sustained over long period of time, will cause ↓ in CAD X and ↑ IM
    - NX ↓
- The larger is the increase in Y* caused by a fiscal expansion, the less private expenditure will be crowded out
- The long term burden of debt is a redistribution of resources away from future generations and toward current generations
- A large debt-to-GDP ratio may lead to expectations of increases in inflation, hampering the conduct of monetary policy
    - The higher the debit-to-GDP ratio, the more constrained is the gov't
- Annually balanced budgets: would eliminate the automatic fiscal stabilizers and accentuate wings in real GDP
- Cyclically balanced budgets: in principle desirable, difficult to define business cycle
- Low and relatively stable debt-to-GDP ratio appropriate indicator of fiscal prudence