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The economic problem (Chapter 2)

PPF- production possibility frontier

- Boundary between obtainable and unobtainable. Given a curve, **anything on inside is obtainable, outside unobtainable**. The boundary is where we should be. Anything inside the boundary would be inefficient, and no tradeoff is required to obtain it.
- In this model economy, everything remains the same (**ceteris paribus**), except the 2 goods we are considering.
- Every choice along the PPF involves some kind of **tradeoff** (i.e having to give up cola to make more pizza)
- This is the **opportunity cost** of the PPF. How much soda to give up to make one more pizza?
- Because resources are not equally productive in all activities, the PPF bows outward
- As the quantity of a good increases, **so does the opportunity cost (pizza becomes more scarce, soda plenty).**
- **The opportunity cost is the cost of a good in terms of other goods foregone.**
- To determine alternative efficient quantities to produce, we compare costs and benefits

Economic growth

- Using PPF of capital goods vs consumption, we pick a midpoint, allowing us to gain much more capital while sacrificing less consumption = growth during the next period
- Two key factors influence economic growth:
- **Technological change:** development of new goods, and better ways to produce these goods (robot manufacturers, computers)
- **Capital accumulation** is the growth of capital resources, which includes **human capital.**
- Cost of economic growth tomorrow is the decrease in our consumption today (we need to allocate some consumption to research, capital accumulation, etc.)

Gains from trade coordination

- To get gains from trade, we have to **coordinate** the choices of individuals
- To make coordination work, **four complementary social institutions have involved over the centuries**
- **Firms-** an economic unit that hires factors of production and organizes those factors to produce and sell goods and services.
- **Markets-** any arrangement that enables buyers and sellers to get information and do business with each other (i.e mall, internet)
- **Property rights-** are the social arrangements that govern ownership, use, and disposal of resources, goods, and services.
- **Money-** is any commodity or token that is generally acceptable is a means of payment.

Circular flows through markets

- Factors of production and goods & services flow in one direction, **money flows in the other direction.**
- Households provide **the factors of production**. Goes to factor markets- firms- goods markets, then back
- Money from households goes to goods markets, to firms, then to factor markets. **Households pay for goods which represents revenue for firms.** Firms pay for factors of production which represents **income** for households.
- **Households own the factors of production –** are sellers in the factor markets, buyers in the **goods markets.**
- Firms use the factors of production to produce goods and services. **Are buyers in the factor markets, sellers in the good markets.**

Coordinating decisions through price adjustments

- **Price is the coordinating mechanism**
- **If** there is not enough of a good available, more supply or less demand is required and **a higher price will accomplish this outcome.**

Measuring GDP and Economic Growth (Chapter 20)

- **Gdp (gross domestic product)** is the market value of all final goods and services produced within a country in a given period of time
- **This definition has 4 parts:** market value, final goods and services, produced within a country, in a given time period

- **Market value –** goods and services are valued at **an arbitrary market value price.** We add everything together (popcorn and computers, apples and carrots, etc.)

- a **final NEW good/service** is an item bought by its **final user** during a specified time period (ex. buying tires at an **auto shop** to put on a car by yourself)
- A **final good** contrasts with an **intermediate good –** which is an item produced by one firm but bought by another firm and used as a component of the **final good (**ex. Toyota purchases tires to put on their **final good of cars).**
- Excluding the value of intermediate goods and services avoids counting the same value more than once (i.e we don't double count the tires **and the cars with the tires).**

- Produced within a country – must be produced in **our country** (does not matter if it's an international company)

- In a given time period, usually annual or quarterly

GDP and the circular flow of expenditure and income

- Households sell and firms buy factors of production in **factor markets.**
- Firms sell and households buy **goods in the goods market.**
- **Consumer expenditure is the total payment** for consumer goods and services by **households**.

- Firms **buy and sell** new capital equipment in the goods market, and put unsold output into inventory.
- The purchase of new plants, equipment, buildings and additions to inventory is **investment (ex.** buying a new oven for your pizza store). **Investment is not financial investment – financial investment involves shares, money, etc.**

- Governments buy goods and services from firms in the **goods market**, this is called **government expenditures.**
- Governments finance their expenditures with **taxes** and pay financial transfers to households (health insurance, pension, EI, subsidies) **This type of transfer of money are not part of the circular flow of expenditure and income as there is no production involved.**

- Net Exports (Exports – Imports) = **counted in GDP. Outside world buys from us in the goods market.**

- **GDP (Y) = Consumption + Income + Government Expenditure + (exports – imports)**. This equation is called the **national accounting identity**
- **GDP = C + I + G + (X-M)**
- **GDP = Income = Expenditure**

Gross vs Net Investment

- Gross means **before deducting the deprecation of capital** that results from **obsolesces**
- The opposite of this is **net (after deductions)**
- **net investment = gross investment – depreciation**

The expenditure approach of measuring GDP

- Expenditure approach measures GDP as **the sum of the consumption expenditure, investment, government expenditure on goods and services, and net exports (exports – imports)**
- **Consumption is nearly always the largest category**
- Net exports can **even be negative** which means **we import more than we export.**

Nominal vs Real GDP

- **Real GDP** is the value of final goods and services in a given year when valued at the adjusted price of a certain base reference year. (ex 2007 prices * sum of 2015 year production)
- This is to **account for discrepancies in change of price –** we only want to measure **production**
- By using **real gdp,** we remove any influence that inflation might have on our comparison
- **Nominal GDP** is valued at the current prices (ex 2015 prices * sum of 2015 year production)

The uses of GDP

- Economists use estimates of GDP **to compare standard of living over time**
- Real GDP per person **is the real GDP divided by the population, tells us what an average person can enjoy**
- Two features of our expanding living standard are: **the growth of potential gdp per person, and fluctuations of real gdp around potential gdp**

- **Potential GDP -** the value of real GDP when all of the economy's labour, capital, land, and entrepreneurial ability **are fully employed and efficient.**
- **Between 1961 and 2010,** real GDP **doubled in Canada.**

Slowdown of GDP growth

- Growth rate slowed after 1970s**.** How costly was that slowdown? **The answer can be provided by what we call the Lucas wedge**
- **Lucas wedge** is the dollar value of the accumulated gap between what real GDP per person would have been if the 1960s growth had persisted and what real gdp actually was.
- **By 2013, real GDP was 45,000** less than it should have been, **the accumulated gap (1970-2013) was 640,000 per person.**

Real GDP Fluctuations – Business Cycle

- A **business cycle** is a periodic but **unpredictable** up and down movement of total production and other measures of economic activity
- Every cycle has 2 phases **– expansion, recession**, and 2 turning points – **peak, trough.**

The Limitations of Using GDP

- Since real GDP only measures things **bought in markets,** some **factors that influence the standard of living** that are not part of GDP are:
- **Household production** (mom washing dishes), **informal markets** (eg under the table jobs, illegal drug trafficking), **health/life expectancy, leisure time, environment quality, political freedom, education level**

Chapter 21 – monitoring jobs and inflation

- Unemployment results in **lost income and production and lost human capital**
- The loss of income is devastating for those who bear it – even **EI cannot make up for it**
- Prolonged unemployment is the most costly form of unemployment as it **permanently damages a person's job prospects by destroying human capital.**
- Short-term unemployment is generally okay – **we are mostly concerned with the duration of unemployment**
- For those under 25, short-term employment is high and fluctuates more strongly, and vice versa for those over 25.

Calculating unemployment

- How is it calculated – **each month conducts a survey of 54,000 households,** and cuts them into 2 groups:
- Working-age population – **number of people aged 15 years or older**
- **Non-working population** – does not meet those specifications
- Working-age population divided into two groups - **people in labour force or not in labour force.** Labour force is the sum of employed and unemployed workers. **These persons must be paid to be in the labour force.**

- One is only unemployed if they are in the labour force and are without work but has made **specific efforts to find a job, waiting to be called back to a job in which they have been laid off, waiting to start a new job within four weeks.**
- People out of the labour force – **retired persons, students not seeking work, persons in the territories or aboriginal settlements, full-time members of the armed forces, inmates in institutions (prisoners)**

Labour market indicators of unemployment

- Unemployment rate – percentage of **labour force that is unemployed (**number of people employed divided by labour force) * 100. Around ~7% in Canada. **Rises during recession, reaches peak when recession ends.**
- Labour force participation rate – percentage of the **working age population** who are members of the **labour force (labour force divided by working-age population) * 100**

Criticisms of unemployment

- Does not include **discouraged searchers (**a person has given up looking for a job, but still wants to work due to **repeated failure).**
- Does not include **long-term future starts (**a person with a job to start in more than 4 weeks is not considered as **unemployed – they are excluded)**
- Does not include **involuntary part-timers** (cannot find full-time job, can only find unrelated work)

Types of unemployment and employment

Frictional unemployment

- **This is unemployment that arises from normal labour market turnover**
- **Examples:** Creation and destruction of jobs requires unemployed people to search new jobs, new people entering and leaving labour force, increases in EI raise frictional unemployment due to less **desire to work**
- This is a permanent and healthy phenomenon of a growing economy.

Structural unemployment

- Employment created by changes in technology or foreign competition that change the **skills required for or location of jobs (**ex. Outsourcing, automation).
- **More people than jobs now**

Cyclical unemployment

- Higher than normal unemployment at the **business cycle trough** and lower than normal unemployment at the peak (ex. Worker gets laid off during recession, rehired after)
- **This is due to the state of the business cycle**

Natural unemployment

- Unemployment that arises **from frictions and structural change** when there is **no cyclical unemployment**
- **Natural unemployment rate** is the natural unemployment as a percentage of the labour force
- This changes over time and is influenced by a number of factors**. Key factors: age distribution of population, scale of structural change, real wage rate, unemployment benefits**
- **Age distribution –** younger or oldcer population will influence job seekers and amount of frictional unemployment (**more old people – less frictional unemployment and vice versa)**
- **Scale of structural change –** if change in technology is swift and overseas competition is fierce, structural unemployment will be high and vice-versa
- **Real wage rate –** the wage rates that bring unemployment are: **minimum wage as mandated by government, and efficiency wage (**the wage selected by firm to attract a better applicant pool and encourage harder work, discourage turnover). These wages will bring **unemployment if they are set above the market equilibrium wage (as dictated when the supply of labour = demand for labour)**
- **Unemployment benefits –** generally, when there is a higher amount of unemployment benefits**, unemployment is increased as** there is less incentive to try to find jobs.

Unemployment and Full employment

- Full employment is the situation when the real unemployment rate equals the natural unemployment rate, when the economy is at **full employment** there is **no cyclical unemployment (i.e all unemployment is frictional and structural).**
- **Output gap is the gap between the real gdp and potential gdp (real gdp – potential gdp) – when** employment is high, the output gap is negative, as real gdp – potential gdp **is negative**
- Over the business cycle, the output gap fluctuates, and the real unemployment rate fluctuates around the natural unemployment rate.

Price Level, Inflation, and Deflation

- **Price level** is the average level of prices and also indirectly the value of money
- **Inflation** is a persistently rising price level**. Deflation is** a persistently falling price level
- We are interested in the price level because we want to
- **Measure the inflation or deflation rate, and also distinguish between money values and real values of economic valuables.**
- **Core inflation rate** is the inflation rate excluding the **volatile items of food and fuel** gives a more stable underlying inflation trend

Why is inflation and deflation a problem?

- Low steady inflation/deflation is **not a problem**
- However, unpredictable high inflation/deflation is a problem because it:
- **Redistributes income –** money wages will be reduced during inflation so workers are worse off. Higher price = **higher income for employer, less for workers.**
- **Redistributes wealth -** Unexpected inflation transfers purchasing powers **from lenders to borrowers – borrows benefit, lenders lose,** as the amount borrows must return is **valued less in the future (ex.** you were lent $100 with interest rate 10% with an expectation that inflation will be 2%. Thus, you expect a **real rate of return of 8% … however, inflation was actually 6% … so your rate of return is now only 4%)**

- **Lowers real GDP and employment –** unexpected increases **or decrease**s in inflation disrupts the regular flow of production, and affect jobs. With inflation, **profits and investment, output go up, making employment go up temporarily.** With deflation, vice persa.
- **Diverts resources from production –** people are now spending more time trying to protect their financial investments

Consumer price index

- CPI measures the **average of prices paid by urban consumers for a "fixed" basket of consumer goods and services**
- CPI is defined to be equal to 100 for **a reference base year, much like the real gdp**
- If a CPI now was 130, it would mean that prices paid by urban consumers for a fixed basket of goods **are 30% higher than they were, when compared to the base year.**

How to construct CPI

- Select the basket of goods to use – **this is done generally through a survey**
- Monthly price survey – **every month, statscan checks the prices of those goods in various cities**
- Calculating CPI – **find cost at base, find cost current, divide current by base, multiply by 100.**
- Example: 10 oranges at $1 and 5 haircuts were $8. **Total = $50. Same in another year,** but now $70 = 70/50 = 140. **Thus, the cpi was 40% higher than during base period.**
- **The basket is always constant – only the prices change**

Uses of CPI and inflation

- Major usage is to measure inflation rate
- **Inflation rate is the percentage change in the CPI level from one year to the next (**cpi this year – cpi last year)/(cpi last year) * 100 (**ex = (130-100)/100*100) = 30%**
- **However, this is always biased (generally 0.5 to 0.6 percent higher) – it generally gives a number that is too high for four reasons:**
- **New goods bias** – new goods that were not available in the base year appear, and if they are more expensive than the goods they replace, they put upward bias on cpi
- **Quality change bias** – quality improvements occur often, part of the price in the price is payment for improved quality, and is not inflation. Cpi does not take this into account, and takes the increased price as inflation.
- **Commodity substitution bias –** the market basket of goods used in cpi is fixed, and does not take into count substitutions away from goods whose relative prices happened to increase (i.e people switched from apples to pears because apples became too expensive) … **preferences change.**
- **Outlet substitution bias –** as the structure of retailing changes, people switch to buying cheaper stuff, but CPI does not take this into account and still uses the old base higher prices.

- **Consequences of this bias:** distorts private contracts, and increases government outlays (close to a third of government outlays are linked to the CPI).
- **This might seem small, but adds up to billions over time**

<u>GDP deflator index</u>

- **GDP deflator is a price index (**we call it this because it is a ratio of prices) **which measures the overall price level =** (nominal GDP / real GDP) * 100
- GDP deflator is a broader measure of the price level because it includes all C, I, G, and (X-M), rather than a basket of goods.
- But as a cost of living, GDP deflator is too broad (**we don't need stuff like erasers or binders to survive)**

Chapter 23 (Finance, Savings, and Investment)

- To study the economics of financial institutions and markets, we distinguish between **finance and money vs physical capital and financial capital**
- The **study of finance** looks at how households and firms obtain and use financial resources and how they cope with the risks that arise with this activity
- The **study of money** looks at how households and firms use money, how much they hold, save, and how banks manage and create it, and how it influences the economy
- **Physical capital** is the tools, instruments, machines, buildings, and other items that have been produced in the past.
- **Gross investment** is the total amount spent on purchase of new capital and on replacing depreciated capital. **Net investment is the change in the quantity of capital = gross – depreciation**

Wealth and saving

- **Wealth** is the value of all things people own. **Saving increases wealth**
- **Private Saving** is the amount of income that is not paid in taxes or spent on consumption. **S = Y – T – C**
- **Income** is something of value (usually money) received during a period of time
- Wealth also increases when the market value of assets rises (ex. **Price of your house goes up)** and vice versa. **This is called capital gain/loss**.
- **Savings are the source of funds to finance investment** purchases and are very important
- These funds are supplied and demanded in three types of financial market:
- **Loan markets –** firms borrow, households also borrow on these markets, credit unions and banks loan out
- **Bond markets –** a bond is a dead instrument (you do not own their company), the issuer promises to make payments on specified dates, and generally subject to such conditions
- **Stock markets –** same as bond, except it means you have a share of ownership in that firm

Financial institutions

- **Financial institutions** are firms that operates on both sides of the markets for financial capital
- It is **a borrower** in one market, and a **lender** in another**. Examples include:**
- **Banks** (borrows through accepting deposits, buys government bonds and securities),
- **Trust and loan companies** (accept deposits, make loans, mortgage loans),
- **Credit unions** (accepts deposits, make loans),
- **Pension funds** (receives pension contributions, use funds to create an investment portfolio that will generate income)
- **Insurance companies** (receives premiums, creates investment portfolio)

Financial Risk

- All financial institutions face **risk. Risk creates two problems: insolvency, and illiquidity.**
- **Insolvency** is the **lack** of available funds to meet obligations
- **Liquidity –** availability of funds to meet claims (i.**e.** house of not as liquid as cash)
- Their net worth is the total market value of what they have lend minus what they borrow: **net worth = assets (what it owns) minus liabilities (what it owes)**
- **If their net worth is positive, it is solvent, and vice versa. If their net worth is negative, they must go out of business.**

Interest rate (rate of return) and asset prices

- The interest rate on a financial asset is the **interest received expressed as a percentage of the price of the asset (ex.** If price of asset is 50 and interest is 5, 10% rate, if asset rises to 250 and interest is sill 5, then 2.5%, if asset falls to 20, and interest is still 5, then 25%).
- **This is an inverse relationship –** higher asset price, ceterius parbus with interest **dollar value remaining the same**, lowest interest rate and vice cersa.
- The price of an asset and interest rate on that asset **are determined simultaneously**

Loanable funds market

- The **market for loanable funds** is the aggregate of all the individual financial markets
- **Funds that finance investment:** private household savings (**S)**, public government budget surplus (**T-G)**, and borrowing from the rest of the world (**M-X)**
- **Deriving the equation for investment:**
- **Y (income) = Consumption + savings + Taxes** in private households
- **Y = C + I + G + (X-M) = C + Spr + T. Therefore, I + G + X = M + Spr + T**
- If we subtract g and x from the left hand side we have **I = S + (T – G) + (M – X)**
- If t-g is actually less than 0, the budget deficit may redirect funds away from the loanable funds from the market

Borrowers vs lenders

- If X-M < 0, then we export less than we import, meaning **we are net borrowers from the world**
- **If X-M > 0**, then we export more than we import, and **thus we are net lenders**
- **Example:** let C + I + G be 100, and (X-M) = 10. Y = 110, Y > C + I + G, which means we have 10 dollars left over = **we are thus lenders in the world.**

Financial flows and circular flow of e/I

- **Households** can use their income for **consumption, taxes, or saving**
- **Firms can borrow** to finance investment expenditure **(I)**
- **Government** can collect taxes **(T),** have expenditures (G), and borrow to finance a deficit or repay debt with a surplus
- **Rest of the world –** engages in borrowing (deficit) or lending (surplus) with us

Real and nominal interest rates in relation to inflation

- The **nominal interest rate** is the number of dollars that a borrow pays and a lender receives in interest in a year expressed as the percentage of the number of dollars borrowed or lent

- Example: If the **annual interest paid on a 200 dollar loan is $10, interest is 5%**
- The **real interest rate** is the nominal rate adjusted for **inflation (approximately equal to the nominal interest rate – inflation rate – this is called the fisher equation).** Ex: inflation 2%, nominal 4%, real = 2%
- The real interest rate is the **opportunity cost of borrowing**
- **Example: Nominal interest rate** tells you how fast money in your bank rises, inflation rate tells you how fast the prices of stuff you want rises, real interest rate is the difference between these two measures, **which tells you how fast the purchasing power of your bank account rises**

Interest rates and market demand of loanable funds

- The market for loanable funds **determines the real interest rate, the quantity of funds loaned, saving, and investment (ignore government)**
- The **quantity of loanable funds demanded** depends on the **real interest rate, and expected profit**
- The **demand for loanable funds** is the relationship between the quantity of loanable funds demanded and the real interest rate, ceterius parbus**. Business investment** is the main item that makes up the demand for loanable funds. **The lower the real interest rate, the higher quantity demanded for loanable funds (movement along the demand curve)**
- The greater the expected profit from new capital, the **greater the total demand for loanable funds (**demand curve shifts outwards)

Interest rates and the market supply of loanable funds

- **The supply of loanable funds** is the between the quantity of loanable funds supplied and the real interest rate.
- **Saving is** the main item that makes up the supply of loanable funds
- Quantity supplied depends on **The change in the real interest rate**
- **Supply depends on:**
- **Disposable income –** more income = more savings = more supply of loanable funds
- **Expected future income – less expect future income = more saving =** more supply of loanable funds
- **Wealth –** less wealth = **more saving =** greater supply of loanable funds
- **Default risk – less default risk =** more supply **due to less risk of person not paying back.**

Equilibrium in the loanable funds market

- The loanable funds market is in equilibrium at the real interest rate at which **the quantity demanded = quantity supplied** of loanable funds

Changes in demand and supply in the financial model

- Financial markets are volatile in the short run, and stable in the long run
- **These fluctuations bring fluctuations in the real interest rate, and in the equilibrium quantity of funds lent and borrowed.**
- **They also bring** fluctuations in **asset prices**
- **An increase in demand** will increase both the interest rate **and the saving and quantity of funds supplied. Increase in supply will decrease interest rate, increase quantity supplied.**

- **Decrease in demand =** decrease in real interest rate, and decrease in funds supplied. **Decrease of supply would increase interest rate, decrease quantity**

Government in the loanable funds market

- A government **budget surplus increases the supply of funds. Real interest rate falls, investment increases, savings decreases.** The additional investment is financed by some private saving plus the budget surplus
- A government **budget deficit decreases the demand for funds, real interest rate rises, investment decreases** as one would have to pay back more**, savings increases** as savers get more interest**.** Investment decreases because **private saving is diverted to finance the deficit.** We call this **crowding-out of investment**

Money, The Price Level, and Inflation (Chapter 24)

- **Money** is any commodity or token that is generally acceptable as a means of payment
- A **means of payment** a method of settling a debt
- Money has **three other functions:** medium of exchange, unit of account, and store of value
- **Money acts as a medium of exchange –** an object that is generally accepted in exchange for goods and services. In the absence of money, people would need to exchange goods and services directly, **which is called a barter**
- **Barter requires a** double coincidence of wants – **both people need to coincidentally want an item, which is hard to achieve.** Money is universally wanted
- **Money acts as a unit of account –** an agreed measure for stating the prices of goods and services
- **Also acts as a store of value –** money can be held for a time and later exchanged for goods and services (**money can hold its value)**

Money in canada today

- **Money in canada consists of currency and deposits**
- **Currency** is the notes and coins held by individuals and businesses
- **There are 2 main official measures of money in canada:**
- **M1** – consists of currency held by individuals and businesses plus **chequable deposits** (demand deposits) owned by individuals and businesses
- **An example of a demand deposit –** funds in accounts that can be removed without notice, and generally pay little to no interest such as **chequing accounts in chartered banks only**
- **M2 consists** of M1 + personal savings deposits + term deposits and other non-personal deposits located in chartered banks
- **Savings deposits – chartered** bank deposits that typically earn a rate of return, and require a stipulated amount of notice to be withdrawn, though rarely enforced
- **Notice deposits –** deposits with have a notice requirement in the contractual agreement with the client, although rarely enforced
- **Term deposit –** bank deposits paying a market rate of return, which are deposited for a **fixed term and thus have limited liquidity**

What is money?

- m1 and m2 **means of payment**. They are **money**.
- **Liquidity** is the property of being instantly convertible into a means of payment with little loss of value (cash is liquid, GIC less liquid)
- **Deposits** are money but **cheques are not** – a cheque is **an instruction to a bank to transfer money**
- **Credit cards are not money –** a credit card enables the holder to obtain a loan, but it with be repaid **with money**. similarly, debit cards are not money

Depositary institutions

- **A depository institution** is a firm that takes deposits from households and firms and makes loans to other households and firms
- **Types of depository institutions:**
- **Chartered banks –** a private firm, chartered under the **bank act of 1871** to deceive deposits and **make commercial loans (**initially could not lend to people). **Banks are there to make profits.**
- **Credit unions** – a cooperative organization that operates to receive deposits from and makes loans to its members
- **Trust and mortgage loan companies**

- **The goal of any bank is to maximize the wealth of its owners**
- To help achieve this objective, the interest rate at which it lends exceeds the interest rate it pays on deposits (this is called the **interest rate spread)**
- **But the banks must balance profit and prudence:**
- Loans generate profit, but also depositors must be able to obtain their funds when they want them, **so banks can't lend out everything they have.**

Chartered banks and assets

- A chartered bank puts depositor funds into four types of assets
- **Reserves: notes and coins in its vaults or its deposit account at the bank of canada**
- **Liquid assets –** Canadian government treasury bills and commercial bills
- **Securities –** longer-term Canadian government bonds and other bonds such as mortgage-backed securities
- **Loans –** commitments of fixed amounts of money for agreed-periods of time

Economic benefits provided by depository institutions

- Depository institutions make a profit from the **interest spread**
- **They provide the following 4 benefits:**
- **Creating liquidity –** they take deposits and are ready to repay them in the short term. They make loans which then can be repaid over longer periods of time (**ex. Citizens don't need to save up forever to buy a house)**
- **Pooling risks:** depository institutions are in the lending business. An occasional default is not severely impactful, due to the massive amount of loans banks lend.
- **Lowering the cost of borrowing:** households and firms need not search for a source, or many sources, for loans. **The bank is there for it**.

- **Lowering the costs of monitoring borrowers:** depository institutions can more easily monitor borrowers which allows institutions to make better decisions and reduce default risk

Regulation and innovation in the depository institutions

- To make risk of failure small, depository institutions are required to hold levels of reserves and owners' capital equal or surpassing the ratios laid down by regulation
- If a Canadian bank fails, **deposits are guaranteed up to 100,000** per depositor through regulation

The bank of Canada

- The bank of canada is the central bank of canada
- A **central bank** is the public authority that regulates a nation's depository institutions and controls the quantity of money
- The bank of Canada is a:
- **Banker to the banks and government-** accepts deposits from other banks and bank of canada
- **Lender of last resort –** it stands ready to make loans when the banking system as a whole is short on reserves (**only during a catastrophic event)**
- **Sole issuer of bank notes –** only bank that is permitted to issue bank notes
- **The bank of canada's** assets are government securities and last-resort loans to banks. **Its liabilities** are bank of canada notes and deposits of banks and the governments. **Most important asset is Canadian government securities.** Most important liabilities are banks notes in circulation and banks' deposits.

The bank of canada's policy tools

- To achieve these objectives, the bank uses **three main policy tools:**

- **open market operations -** which is the purchase of sale of government securities by the bank of canada from or to a chartered bank or the public
- When the central bank buys securities, **it pays for them by creating new reserves for the banks (increases reserves in a bank).** When it sells securities, **they are paid for with reserves held by the bank (decreases reserves in a bank)**
- **Thus, open market operations influence banks' reserves**

- **The bank rate** is another policy tool used by the central bank
- **The central** bank makes a short-term loan when the banking system is short on reserves
- **The interest rate** on these loans is a **bank rate**
- Bank rates acts as an anchor for other short-term interest rates and is closely related to the bank's target for the overnight loan rat**e**

How do banks create money?

- Banks create deposits when they make loans, and the new deposits created are new **money**
- The quantity of deposits that **banks can create is limited by three factors**
- **The size of the monetary base (the sum of bank of Canada notes, coins, and banks' deposits at the bank of canada**).

- This size limits the total quantity of money that the banking system can create because **banks has desired resources,** and households and firms have **desired currency holdings**. **Both of these depend on the quantity of money**

- **The banks actual reserves** consists of notes and coins in its vault and its deposits
- **Desired reserves –** number of reserves the bank **plans to hold**
- **Desired reserves ratio –** is the ratio of the banks actual reserves to total deposits that the bank **plans to hold.**
- **This is equal to** reserves/total deposits
- **The desired reserves ratio** exceeds the **required reserve ratio** (**the minimum amount required that banks must hold against deposits**) by the amount that the banks determines to be prudent for its daily business.
- There is **no reserve ratio required** by government policy, rather it is upon the decision of the banks
- **Excess reserves = actual reserves – desired reserves**

- **Desired currency holding –** people like to hold a fraction of their money as currency
- when quantity of currency increases, the quantity of currency one wants to hold also increases
- because desired currency holding increases when deposits increase, currency leaves the banks when they make loans and increase deposits (harder for banks to do business if no one deposits money)
- The leakage of reserves into currency is called **the currency drain.** A **currency drain** decreases the amount of money that banks can create from a given increase in monetary base.
- the ratio of currency to deposits is the **currency drain ratio**

Money creation process

- Starts with increase in monetary base. The bank of canada conducts an open market operation in which it buys securities, and thus **creates newly created bank reserves**
- **Banks now have more reserves**, and thus more money to **lend out.**
- **Lending money =** money is created

The influence on money holding demand

- How much money do people want to hold in terms of **cold, hard cash**? Here are **the 4 main factors that influence this:**
- **The price level (**average value of prices) – a rise in the price level **increases the quantity of nominal money,** but not the quantity of **real money (actual value). Real money =** nominal money divided by price level. The quantity of nominal money demanded is proportional to the price level – 10% increase in price level = 10% increase in nominal demanded
- **The nominal interest rate –** since money is in your pocket, it is not collecting interest **so it is the opportunity cost of holding money**, and thus the higher the nominal interest, the **less quantity of real money people hold**
- **Real GDP - if it increases, it** shifts demand curve **to the right** as **it increases volume of expenditure, making people want to hold money, and vice versa**

- **Financial innovation –** shifts demand curve **left** by **lowering cost of switching** between money and interest-bearing assets, and thus decreases demand for **real money (example: ATMs** mean people hold less cash)
- **The demand for money is the relationship between the quantity of real money demanded, and the nominal interest rate,** ceterius parbus

Money market equilibrium

- Money market equilibrium occurs when the **quantity of money demanded equals the quantity of money supplied**
- Adjustments that **occur to bring about money market equilibrium are fundamentally in the short run and the long run**
- **If quantity someone is willing to hold** is less than supply due to **high interest rate**, then people try to get rid of their excess money by **buying bonds,** which lowers the interest rate as **bond prices go up**
- **If quantity someone is willing to hold is** more than supply **due to low interest rate**, then people try to get more **money through selling bonds, making bond price go down,** which increases the interest rate to equilibrium

The short-run effect of a change in quantity of money

- Increased money supply – people will be holding more money than quantity demanded, and thus **interest rate goes down as people buy bonds, causing price to go up. The vice versa is true**

The long-run equilibrium of money markets

- In the long run, the loanable funds market **determines the real interest rate, and thus won't change in the long run**
- Nominal interest **rate equals the equilibrium real interest rate plus the expected inflation rate**
- **In the long run, real gdp equals potential gdp, so the only variable left to adjust is the price level**
- **When** inflation is expected and real GDP = potential gdp, then all other markets are **also in long-run equilibrium**
- Thus, is the bank increases **money supply,** we reach a new long-term equilibrium where **only the price level has changed.**
- **The price level will change by the same percentage as the change in the money supply (M), meaning that nothing real actually changes**

The transition from the short run to the long run

- If we start in full-employment long-run equilibrium, **if the bank of canada increases quantity of money by 10%, nominal interest rate falls**
- As people buy bonds, **real interest rate falls. As real interest rate falls,** consumption expenditure and investment borrowing increases. **Aggregate demand increases, but since real gdp = potential gdp, there are shortages**
- **With the economy at full employment, the price level rises.**
- **As price level rises,** quantity of **real money decreases**, and the process begins to **reverse itself**

- Nominal interest rate and real interest rate **rise.** As real interest rate **rises, expenditures are cut back, and eventually original equilibrium is restored**
- **In the new long-run equilibrium,** the price level rise 10%, **but nothing else has changed**

The quantity theory of money

- **the quantity theory of money** is the proposition that in the long run, an increase in the quantity of money brings an equal increase **in the price level**
- **this is based off the velocity of circulation –** average number of times in a year a dollar is used to purchase goods and services in GDP
- **Thus, Velocity*Money = Price*Real GDP**
- **The equation of exchange means MV = PY,** and since gdp is determined by factors of production and technology, the change in money is equal to the change in the price level **in the long run**
- **We** assume that velocity and real gdp are independent of the quantity of money.
- In the long run, **inflation is caused by money growth in excess of what is required for a growing economy.** But if real gdp = potential gdp, this influence will be small, and is assumed to be **equal in theory.** therefore, inflation is **correlated to the money growth rate**

<u>The Exchange Rate and The Balance of Payments (Chapter 25)</u>

The foreign exchange market

- To get goods and services in another country, **we need money of that country**
- **Foreign bank notes,** coins, and bank deposits are called **foreign currency**
- **We get** foreign currency in the **foreign exchange market –** the market in which the currency of one country is exchanged with the currency of another
- The price at which one currency exchanges for another is **a foreign exchange rate**
- A fall in value of another currency in terms of another is **currency depreciation. Appreciation is the opposite**
- The **nominal exchange rate** is the price of one currency in terms of another. Like all prices, **the exchange rate is determined in a market**
- With many traders and no restrictions, **the foreign exchange market is a competitive market**

Demand and supply in the exchange market

- Demand for one money **is the supply of another (**if we demand USD, we would thus supply CAD). Thus, **factors that influence demand for CAD** would influence **supply of other common currencies (Yen, USD, Sterling, Euro), and vice versa for demand of another currency.**

Demand in foreign exchange market

- The **quantity of Canadian dollars that traders plan to buy** in the foreign exchange market depends on the **following four traits:**

- **The exchange rate**

- **World demand for Canadian dollars** – if world demand for Canadian exports increase, demand for Canadian dollar increases

- **Interest rate differential –** the Canadian interest rate minus the foreign interest rate. If **Canadian interest rate differential rises –** demand for Canadian dollars will increase
- **Expected future exchange rate –** at a given exchange rate, if expected future rate is **to rise, demand for Canadian dollars increases, and curve shifts to the right**

- **(**movement along the curve) – **the demand for dollars is a derived demand, other things remaining the same, the higher the exchange rate, the smaller is the quantity demanded.** (no one wants our money because it's so expensive)
- **Exports effect -** Canadian exports are valued more as they're cheaper, and thus would demand more quantity of Canadian money.
- **Expected profits effect –** larger expected profit from holding Canadian dollars, greater quantity demanded and **vice-versa.** Thus, **the lower the exchange rate,** ceterius parbus, and then **the expected profit rate will be larger.**

Supply in the Foreign Exchange market

- Quantity of Canadian dollars supplied in the foreign exchange market is the amount **that traders plan to sell during** the given time period at a given exchange rate
- Depends in the following **main factors:**

- **The exchange rate –** higher exchange rate, **greater quantity of Canadian supplied**. Influences quantity supplied for two reasons: **imports effect and expected profits effect.**
- **Canadian demand for imports –** if Canadians demand more imports, **supply of Canadian dollars increases,** as we need to buy more foreign currency and supply more Canadian currency
- **Interest rates in Canada and other countries –** if interest rate differential rises, **at a given exchange rate, then supply decreases,** as people want to **hold onto Canadian money**
- **The expected future exchange rate -** if expected future rate is **to rise,** supply would **go down, as no one would want to sell Canadian money and vice-versa**

- **Imports effect** = higher exchange rate **means greater value for Canadian imports so greater quantity of dollars supplied**
- **Expected profits effects –** the lower currency exchange rate, **the greater expected profit from holding Canadian dollars, so quantity supplied is smaller as no one wants to trade their Canadian dollars out.**

Market equilibrium in the Foreign Exchange Market

- When quantity supplied meets quantity demanded, **we reach market equilibrium price**
- **If exchange rate is too high,** surplus of Canadian dollars drives it down, and **vice-versa**
- **If** demand increases, and supply does not change, **exchange rate rises, quantity rises, and vice versa.**
- If supply increases and demand does **not change, then exchange rate goes down, quantity rises and vice-versa.**

The real exchange rate

- **The real exchange rate** is the relative price of Canadian produced goods to foreign produced goods**.** It measures the quantity of real gdp of other countries that a unit of Canadian real GDP buys
- **Real Exchange Rate = (Nominal exchange Rate * Domestic price level) divided by foreign price level. RER = (E*P)/Pf**
- We want to see **how many of an identical good per Canadian good can be exchanged.**

Short-Run effects of exchange rate changes

- In the short-run, if nominal exchange rate changes, P **and P* do not change, and the change in E brings a change in RER. This change is proportional**

Long-Run effects of exchange rate changes

- In the long run, **the quantity of money determines the price level in that level**
- **In the** long run, the nominal exchange rate is determined by the RER and the prices
- If RER = E * P/P* then **E= RER * P*/P**
- Thus, if P* is rising faster than P, **the Canadian dollar will appreciate**
- if **P** is rising relatively faster than P*, **the Canadian dollar will depreciate.**
- For a given **real exchange rate,** a change in the quantity of money will **change the price level and exchange rate due to the quantity theory of money**
- **Thus,** if money is introduced, then price level rises proportionally, which **means that also the quantity of money is proportional to the exchange rate**

Exchange Rate Policy

- There are generally **three possible exchange policies**:
- **Flexible exchange rate-** a rate that permits the exchange rate to be determined by market forces of demand and supply, no government or **bank intervention.**
- **Fixed exchange rate –** a policy that pegs or fixes the exchange rate at a value that they **decide upon through direct intervention.** If demand increases, bank would then sell Canadian dollars **to increase supply** in order to make sure exchange rate does not go up, **and vice- versa.**
- **It is easier to depreciate a currency, as one could just theoretically print more money.** appreciating a currency **requires spending reserves of foreign currency**
- **Crawling Peg –** an exchange rate that follows a path that the stat chooses, **it works like a fixed rate, but the target changes over time.** The idea behind this is to **avoid wild swings in the volatile market, and to also** avoid running out of reserves, which can happen with **a fixed exchange rate.**

<u>Chapter 26 – Aggregate Supply and Aggregate Demand</u>

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 quantity between **quantity of real gdp supplied and the price level**
- We distinguish **the long-term and short-term** with different states of the labour market

Long-run aggregate supply

- **Long-run aggregate supply** is relationship between quantity of real gdp supplied by **firms and the price level when real gdp = potential gdp**
- Potential gdp is independent of the price level, so long-run aggregate supply curve is vertical at potential gdp
- In long run, **quantity of real GDP supplied is potential gdp**
- As price level rises, and money wage rate changes by the same percentage, **nothing real changes, so real gdp supplied = potential gdp**

Short-run aggregate supply

- **Short-run aggregate supply is** relationship between quantities of real gdp supplied and price level when **wage rate, prices of goods, and potential gdp are constant.**
- A rise in price level with no change In the money wage **increases quantity of real gdp supplied**
- **Upward sloping curve**
- **In the short run –** quantity of real gdp supplied if the price level increases. A **rise in the price level** with no change in money wage **induces firms to increase production** (they can earn more, and don't need to pay workers any more)
- The short-run curve can exceed or go below the long run curve, which is **potential gdp –** short-run supply **can exceed potential gdp.**

Changes in aggregate supply (shifting curve)

- Aggregate supply changes if an influence of production plans other than the price level changes
- These include:

- **Changes in potential GDP – when potential gdp increases, long-run and short-run supply curve shift to right, and vice-versa.**
- Potential GDP increase if full employment quantity of labour increases, quantity of capital increases, or an advance in technology occurs.

- **Changes in money wage (and other factor prices) –** will **only change the short-range supply curve.** Rise in money wage **shifts curve left (less supply)** and **vice-versa.**

Aggregate demand

- Quantity of real GDP demanded is **the total amount of final goods and services in canada that everyone buys**
- **The aggregate demand curve** is the relationship between the quantity of real GDP demanded and the price level
- This quantity is the s**um of C + I + G + X – M**
- The aggregate demand curve slopes downwards for 2 reasons:

- **Wealth effect –** a rise in price level decreases the quantity **of real wealth –** to restore **real wealth, people decrease spending and increase saving,** decreasing quantity of real gdp

demanded. The opposite is true – fall in price level **increase wealth, increase spending, increase real gdp demanded.**

- **Substitution effects:**
- **Intertemporal substitution effect –** a rise in price level decreases value of **real money** and raises **interest rate –** when interest rate rises, people borrow and spend less, and quantity of **real gdp demanded decreases.** Similarly, a fall in price level increases **real value of money, and lowers interest rate,** increasing spending and borrowing and thus **quantity of real gdp demanded decreases.**
- **International substitution effect –** rise in price level increases price of domestic goods, **exports decrease and imports increase,** decreasing the GDP demanded. **The opposite is true**

- Buying plans depend on many factors, and some of the main ones are:

- **Price Level –** movement up and down the demand curve. **Higher price level – less quantity demanded and vice-versa.**

- **Expectations –** expectations about future income, inflation, and profits change aggregate demand. Increases in **expected future income increase demand and vice-versa.** Rise in expected inflation rate **increases demand and vice-versa**. Increase in expected future profits **increases demand and vice-versa.**

- **Fiscal and monetary policy:**
- **Fiscal policy** is the government's attempt to influence the economy by setting and changing taxes, making transfer payments, and purchasing good.
- **A tax cut or increase in transfer payments** increases **disposable income,** and thus **increases aggregate demand and vice-versa. Increase in** government expenditure **increases aggregate demand**
- **Monetary policy** is changes in interest rates and quantity of money in the economy
- **Increase in quantity of money =** increased buying power and aggregate demand and **vice-versa**
- **Cut in interest rate =** more spending, less saving = **increased demand**

- **The world economy –** fall in exchange rate **lowers price of domestic goods/services,** and thus **increases aggregate demand and vice-versa**
- Also, an **increase in foreign income** increases demand for Canadian exports, and **increases aggregate demand (**ex. China middle-class now can afford more Canadian goods)

Short-Run Macroeconomic Equilibrium

- **SR macroeconomic equilibrium** occurs when quantity of real gdp demanded equals SAS
- if real gdp above equilibrium, firm decrease production and lower prices, and **vice-versa**
- **in short run,** real gdp can be greater or **less than potential gdp**
- This causes demand to shift right too. **A bigger shift than the LAS is inflation, which is the difference between the demand shift and the LAS shift**
- Inflation is the **rise in the price level at the new equilibrium**

Long-Run Macroeconomic Equilibrium

- occurs when real gdp equals potential gdp – when economy is on its **LAS curve**
- thus occurs at the intersection of AD and LAS curves
- **Economic growth occurs when LAS shifts to the right**

Business cycle in AS-AD model

- Occurs because aggregate demand and SAS fluctuate, but money wage does not change rapidly enough to keep real gdp at potential
- **Above full-employment equilibrium** is when real gdp > potential gdp, and **vice versa.** Full employment equilibrium is when **real gdp = potential gdp**

Causes of Economic Fluctuations in the Short-run

- **Fluctuations in aggregate demand** – if aggregate demand shifts to the right**, spending plans increase,** real gdp > potential gdp, which has opened an inflationary gap. Now, firms must raise wages, **which causes aggregate supply to shift to the left as firms cannot pay as many people high wages.**
- The price level rises, and real gdp starts to decrease until it equals **potential gdp**.
- When aggregate demand shifts left, spending plan decrease, real gdp < potential gdp, firms **then can decrease wages,** causing them to start producing more. Price level falls, supply shifts right

- **Fluctuations in aggregate supply –** if sas shifts left due to for example an **adverse supply shock (**a supply shock increases a firms cost, making them produce less i.e. labour costs more, oil price rise)
- **Real gdp decreases, price level rises = stagflation**
- In the long run, when the increased price returns to its original level, **the economy should return to full employment**

Macroeconomic Schools of Thought

- **Classical –** believes economy is self-regulating and always at full employment. Neo-classical view is that business cycle fluctuations are the efficient responses that a good market, and that shocks arise naturally from uneven technological change
- **Keynesian –** believes that economy rarely operates at full employment when left alone. Active help through fiscal and monetary policy is required. A neo-keynesian view holds that not only is the money wage sticky, but also the prices of goods sticky – **SAS curve is horizontal** to a price level – **perfectly elastic SAS supply**, **so if demand shifts, only real GDP changes. Thus, aggregate demand determines real GDP**
- **Monetarist –** monetarist view believes economy is self-regulating at full employment provided that monetary policy is not erratic, and pace of money growth if kept **steady.** As long as **money supply is controlled,** economy is self-regulating.

<u>Expenditure Multipliers (Chapter 27)</u>

Fixed prices and expenditure plans

- Gdp = components of expenditure summed up

- **Consumption and imports are influenced by real gdp (**equivalent to **income)**
- Thus, there is a **two-way link** between aggregate expenditure and real gdp**. Ceterius parbus, increase in income increases expenditure, and increase in expenditure increases real gdp (**which is equivalent to income) and **vice-versa.**

Consumption and Savings plans

- Consumption expenditure is influenced by many factors, but most direct one is **disposable income**
- **Disposable income** is aggregate income (real GDP) minus **taxes plus transfer payments, called YD. YD = Y – T**
- **Disposable income is either spent or saved.** That is, YD = S + C
- The relationship between consumption and disposable income is the **consumption function**
- The relationship between saving and disposable income is **the saving function**
- When consumption is **more than YD,** saving is negative (dissaving), and vice-versa.
- Consumption function always has a **positive y-intercept because you must always consume, no matter how much you earn.**
- **Autonomous consumption –** the amount of consumption that would take place in the short-run even if people have no income
- **Induced consumption –** an increase in planned consumption expenditure brought about by an increase in **disposable income**

Marginal propensities to consume and save

- **The** marginal propensity to consume (MPC) - **the fraction of a change in disposable income spent on consumption**
- It is calculated as the change in consumption expenditure, **divided by the change in disposable income that brought it about**. Mpc = change in **consumption divided by change in disposable income**
- **MPC is the slope of the consumption function** this will always be between 0 and 1, **theoretically**
- MPS (**marginal propensity to save)** is the fraction of a change in disposable income that is saved. MPS = **change in saving divided by change in income**
- Generally, **mps + mpc = 1,** because if you **don't consume, you save.**

Consumption as a function of Real GDP

- Disposable income changes when **either real gdp chances or net taxes changes, as (YD = Y – T)**
- If taxes don't chagce, real gdp is only influence, so consumption is a function of real GDP, ceterius parbus
- This relationship can determine real GDP **when the price level is also fixed.**

Import function

- Canadian imports are influence by Canadian GDP (income)
- The **marginal propensity to import** is the fraction of increase in Canadian real gdp spent on imports.
- If imports increase by 25 million and gdp increase by 100 million, **MPI is 0.25**

Real GDP with a Fixed Price Level

- **Aggregate planned expenditure** is planned consumption = C + I + G + (X – M), all of these variables being planned, and is determined by **aggregate expenditure plans**
- Planned consumption expenditure and planned imports **are influenced by real gdp**. When real gdp increases, **these factors increase**
- **Planned investment** plus planned government expenditure plus planned exports **are not influenced by real gdp**
- The relation between aggregate planned expenditure and real GDP can be **described by an aggregate expenditure schedule, at each level of gdp**
- **This relationship can also be described by an aggregate expenditure curve,** which is the graph of the aggregate expenditure schedule
- **Consumption** expenditure minus imports, is **induced expenditure (**varies with real gdp)
- **The sum of government investment,** expenditure, and exports, which does not vary with GDP is **autonomous expenditure**
- **Aggregate planned expenditure** may differ from GDP because firms can have unplanned changes in inventories

Equilibrium Expenditure

- Occurs when **aggregate demand expenditure equals real gdp – AE = Y**
- **Equilibrium occurs at the point at which the aggregate** expenditure curve crosses the 45 degree line.
- **In equilibrium, there are no planned changes in business inventories**
- If AE exceeds gdp, there is **an unplanned decrease in inventories.** firms hire workers and increase production and thus decreasing inventories, **causing real gdp to increase and vice-versa**
- **If there** is equilibrium (AE = GDP), there is no planned change, so firms maintain their production and gdp remains constant.

Expenditure Multipliers

- When autonomous expenditure changes, so does equilibrium expenditure and **real GDP**
- **But the** change in equilibrium expenditure is **larger** than the change in autonomous expenditure
- the **multiplier** is the amount by which a change in autonomous expenditure is magnified, or **multiplied** to determine the change in equilibrium expenditure and **real gdp**

Idea and process of the multiplier

- an increase in investment or any other autonomous component **increases real Gdp**
- **The increase in real gdp** leads to increase in induced expenditure. The increase in induced expenditure leads to **a further increase in aggregate expenditure and real gdp**
- **so real gdp increases by more than the initial increase in autonomous expenditure**
- increase in autonomous expenditure causes **planned decrease in inventories,** production increases, **real gdp increases**

Why will the multiplier be greater than 1?

- Increase in autonomous expenditure induces further increase in aggregate expenditure

- The size of the multiplier is the change in equilibrium expenditure divided by change in autonomous = (**change Y / Change in Auto)**
- **When there are no income taxes and no imports,** the slope of AE curve equals the marginal propensity to consume, **so multiplier is 1 + (1- MPC) and also to 1+ MPS**
- Multiplier = 1/ (**1- slope of AE curve)**

<u>The Business Cycle, Inflation, and Deflation (Chapter 28)</u>

Inflation Cycles

- In long run, inflation occurs if quantity of money grows faster than potential GDP
- In short-run **many factors can start an inflation**
- **There are 2 sources: demand-pull inflation, and cost-push inflation**

Demand-pull inflation

- Happens when **aggregate demand increases** (**cut in interest rate, increase in money, increase in govt expenditure, etc.**) any change in C + I + G + (X – M)
- Shifts curve to the right, price level rises, **real gdp > potential gdp -> creates inflationary gap**
- The response is that money wage rises due to **labour now being in short supply**, and **SAS curve shifts leftwards,** and real gdp goes back to potential gdp, **but price level goes up**
- This outcome **is a one-time price increase and not an inflation**. For an inflation to take place, this process **would have would have to persist**
- Only an ongoing increase in quantity of money can sustain continued repeated increase in AD and lowering of SAS (**demand-pull process)**. **This is inflation**

Cost-Push inflation

- Increase in cost of something (oil) would decrease aggregate supply, sas shifts left
- gdp goes down, price level goes up, Real GDP < potential gdp, **causing recessionary gap**
- **policymakers** respond with an aggregate demand response, and thus, **they try to increase the quantity of money to increase aggregate demand**
- Thus, **real gdp increases again to LAS (potential GDP),** and price level rises again.
- **Persistently doing this will cause inflation**

Expected inflation

- Aggregate demand increases, but this is **expected, so effect on price level is also expected**
- The money wage rate rises **in-line with the expected rise in the price level**
- **Anticipated inflation brings inflation, but no real change in gdp, that is - If** price and money wage go up, **real gdp will not change**

Forecasting inflation

- To expect inflation, **people must forecast it**
- A rational expectation is no necessarily correct, but it is the best available

Inflation and business cycle

- If forecast is correct, **we stay at full employment**

- **If** aggregate demand grows faster than expected, **real gdp moves above potential gdp**
- The inflation exceeds expected rate and economy **behaves as though it's in demand-pull inflation**
- If aggregate demand (inflation) grows more slowly than expected, **vice versa and cost-push inflation happens**

Deflation

- An economy experiences deflation **when it has a persistently falling price level**
- The price level falls persistently **if aggregate demand increases slower than supply**
- Quantity theory and deflation = **inflation = money growth rate + velocity – real gdp growth**
- Deflation occurs if **money growth rate < real gdp growth rate – rate of velocity change**
- **Consequences of deflation:** redistributes income and wealth (**increases wages)**, lowers gdp and employment **as firms hire fewer workers**, and diverts resources from production
- **How to stop deflation:** increasing growth rate of money, making the money growth rate exceed the growth rate of real gdp minus rat of velocity change

<u>Fiscal Policy (Chapter 29)</u>

Budget Making

- The federal government and parliament make fiscal policy in a long process, then enacts laws necessary to implement it
- The federal budget has **two purposes, to finance activities of government, and to achieve macroeconomic objectives**
- **Revenues** come from personal **income tax, corporate tax, indirect tax, and investment income, with personal income tax being largest**
- **Outlays** are transfer payments, expenditure on goods and services, and debt interest. **Transfer payments** are the largest item of outlays
- **Fiscal policy** is the use of the federal budget to achieve macroeconomic objectives, such as full employment, sustained economic growth and price level stability
- **If revenue exceed outlay,** surplus, otherwise deficit. If even, then **balanced**

Government Debt

- Is the amount of government borrowing, and the sum **of past deficits minus past surpluses**
- Budget deficits became a problem in the 1970s for 22 years in a row up to the 1990s, with highest debt to gdp ratio being 68.5%
- Because GDP is a measure of ability to raise tax revenue, **a declining debt to gdp ratio indicates economy is, in some sense, living within its means**

Supply-side effects of fiscal policy

- Fiscal policy has important effects on **employment, potential gdp, and aggregate supply**, called **the supply-side effects**

- An income tax **changes full employment and potential GDP.** Supply of labour **decreases** because the tax decreases the **after-wage** rate. Initially, we **are at equilibrium at the full-employment level**

- People work less when **the income tax is higher**
- Outcome: The before-tax real wage increases, but the after-tax real wage rate falls, **this gap is called the tax wedge.** Furthermore, quantity of **labour hours is smaller.**
- When quantity of labour hours decreases, **potential gdp decreases.**
- **Taxes on** consumption expenditure adds onto the tax wedge = **income tax + HST**

Taxes and incentive to save and invest

- Tax on interest income lowers the quantity of saving and **slows the growth rate of real gdp**
- The interest rate that influences saving and investment is the **real after-tax** interest rate. **This is the interest rate on investment minus the government tax on such investments**
- Tax decreases supply of loanable funds, makes a tax wedge, **and investment and savings decrease (e. 3% tax,** cost of borrowing is 4%, profit from lending is only 1%, so both **decrease).** Although real interest rate increases, **after-tax interest rate actually falls.**
- However, only **nominal** amounts are taxed, **so we must also consider the inflation rate**
- **Examples:** 0% inflation, 40% tax rate, 4% real interest rate = **nominal interest rate* (1-tax rate) – inflation = .04 (1- .4) – 0 = 2.4%**
- 6% inflation, 40% tax rate, 4% real interest rate = .1*(0.6) - .06 = 0. In this example, the **true tax rate is actually 100%!** You get nothing!

Laffer curve

- Relationship between tax rate and amount of revenue collected is the **laffer curve – it is an inverted u shape**
- T* is the maxima of this functions
- For a tax rate below t*, rise in rate increases revenue, and vice versa

Fiscal Stimulus

- Use of fiscal policy to increase production and employment
- Can be **automatic or discretionary**
- **Automatic** is action triggered by state of economy without government action, **discretionary is triggered by parliament**
- Two items in government budget change automatically in response to state of economy: **tax revenues and transfer payments**

<u>Automatic fiscal stimulus</u>

Automatic Changes in tax revenues

- Parliament sets tax rate people pay, but income **varies with real gdp**
- When real gdp increases, **tax revenue increase and vice-versa**

Transfer Payments

- Government can create programs to benefit people and businesses (EI, grants, etc).
- Depends on economic state – during expansion, unemployment falls so EI payout requirement decreases. In recession, more people need EI, so increases

- Since in boom, tax revenue increase and outlay decrease and vice-versa, budget can provide an automatic stimulus to help shrink inflationary or recessionary gaps

Cyclical and Structural Balances

- **Structural surplus/deficit** is the budget balance that would occur at full employment
- **A cyclical surplus or deficit** is the actual surplus/deficit minus structural surplus/deficit
- **Thus, cyclical surplus or deficit occurs purely because real gdp does not equal potential gdp**
- **If real gdp = potential gdp,** and there is a deficit or surplus, **then it is structural**

Discretionary Fiscal Stimulus

- Most discretionary fiscal stimulus focus on its effects on **aggregate demand**
- Changes in G and T change Y (aggregate demand) and have multiplier effects
- Two main fiscal multipliers are: **government expenditure multipler, and tax multiplier**

Government expenditure multiplier

- Is the quantity effect of a **change in government expenditure on real gdp.**
- Increase in G = increase in Y**.** An increase in government expenditure **also increases government borrowing and raises interest rate,** thus possibly crowding out investment. This over dominates the multiplier for expenditure.
- **Thus, the multiplier is usually less than 1,** meaning for every $1 increase in government expenditure, there is **less than $1 increase in real gdp.**

Tax multiplier

- Is the Quantity effect of a change in taxes on **aggregate demand**
- Demand-side effects of a tax cut are smaller than government expenditure increase, as **people choose to save some money**
- If government knows what the multiplier is, they can increase **only some spending or decrease only some taxes,** and the multiplier will do the rest to achieve equilibrium

Fiscal stimulus and aggregate supply

- Taxes drive wedge between cost of labour and **take-home pay**
- **They decrease savings, employment, investment, and gdp**
- Tax cut decreases **these negative effects**
- **The supply-side effects of a tax cut dominate demand side –** makes supply-side tax multiplier larger than government expenditure multiplier

Time lags

- The use of discretionary fiscal policy is seriously hampered by time lags:
- **Recognition lag –** the time it takes to figure out fiscal policy action is needed
- **law-making lag** – takes time in parliament to pass stuff
- **Impact lag –** takes time from passing tax or spending change to its effect on real gdp being felt

Monetary Policy (Chapter 30)

- Monetary policy stems from relationship between the central bank and government

- **Bank of canada has instrument independence (policy tools),** but not **goal independence (policy direction)**
- Thus, monetary policy is ultimately political, banks job is **to control quantity of money and interest rates, and to try to prevent excessive swings in real gdp growth and unemployment.**

Policy goals

- Number one policy goal is to keep inflation between 1 and 3 percent
- This is measured in the CPI – **this type of policy is called inflation targeting**
- In the early 90s, inflation was much higher, but recently, **the bank of canada has been doing generally well in enforcing this policy**
- The bank and policymaker will keep a look at both inflation measured by CPI and inflation measured by the core CPI, as core cpi is a better measure of the underlying inflation trend

Core Consumer Price Index

- Same as cpi, but excludes 8 of the most volatile components, as well as excludes the effects of changes in indirect taxes on the remaining items.

Rationale for inflation control target

- Two main benefits from adopting this include: **fewer surprises and mistakes on the part of savers and investors, and anchors expectations about future inflation**

Controversy of inflation control

- **Critics of inflation targeting fear that –** by focusing on inflation, bank might permit unemployment to rise or real gdp to slow or that the bank might permit value of dollar to rise on the foreign exchange market and make exports suffer
- **Supports believe that –** keeping inflation low and stable is the best way to achieve full employment and sustained growth. The bank's record is good, last time it faced recession was when inflation 1990s was in double digits.

Responsibility for monetary policy

- Bank of canada is responsible for conduct of monetary policy (instrument independence)
- Governor and minister of finance **must consult regularly**
- **If minister disagrees, they may direct banks to follow a profoundly different course, and obliged to accept the directive (**non-independence of goals)
- **Government thus has directive power**

Origins of the directive

- **1961,** governor of the bank got into disagreement with minister of finance
- **Coyne** resigned, and rasminsky took over
- **Resminsky declared that in event on disagreement,** minister must issue directive and force banks to comply
- No directive has ever been issued, **as to do so is political suicide**

Conduct of Monetary Policy

- How does bank conduct monetary policy – **what tools do they use, how does it make their policy decision**
- **A monetary policy instrument** is a variable that the BoC can directly control or closely target
- There are three possible instruments**:**
- **monetary supply**
- **price of Canadian money of the foreign exchange rate**
- **opportunity cost of holding money (short-term interest rate)**
- **the** bank cannot use all 3 instruments simultaneously
- **If** bank decreased quantity of money, **both interest rate and exchange rate would rise**
- **If bank** increased interest rate, **quantity of money would decrease and exchange rate would rise,** as demand for Canadian money increases and supply of decreases
- If bank lowered interest rate, **quantity of money would increase and interest rate would fall**

The overnight loans rate

- Bank of canada's choice of policy instrument **is a short-term interest rate**
- This special rate is called the **overnight loans rate** which is **the interest rate on overnight loans that chartered banks make to each other**
- If bank wants to **slow inflation,** it raises overnight interest rate **to dampen spending.** If the bank wants to avoid recession, **it lowest overnight rate to ensure higher spending**
- Bank gets the overnight loans rate to move to the target level **by using an open-market operation to affect reserves in banking system**

BoC decision on interest rate

- To make such a decision, bank gathers a large amount of data on economy, shocks, and policy
- Bank must then process all the data and then **makes a decision. After doing so, it engages in public communication explaining the decisions**

<u>Tools bank uses to achieve rate</u>

Operating Band

- Target overnight rate +/- .25 percentage points. The bank sets this band by setting **bank rate (**interest rate that boc charges big banks on loans, which is set at overnight loans rate +.25) and also a **settlement balances rate (**interest rate bank pays on reserves, set at overnight loans rate -.25)
- **The overnight loans rate** cannot exceed bank rate as then **banks could profit from borrowing from bank of canada and lending to another bank**
- However, since all banks can borrow from bank of canada at the **bank rate,** no bank is willing to pay more than bank rate to borrow reserves
- Similarly, **overnight rate cannot fall below settlement balances rate.** If it did, bank could profit from borrowing from another bank and increasing reserves at boc.
- Since all banks can earn at settlement balances rate, **no bank will lend at a rate below that level**

Banks demand for reserves

- If overnight loans rate equals bank rate, **banks are indifferent between borrowing and lending and lending reserves,** making demand curve horizontal at bank rate
- If overnight loans rate equals **settlement balances rate,** banks are indifferent between holding/lending reserves, and RD is horizontal
- If overnight rate lies between bank and settlement balances, banks are willing to borrow and lend to another at the rate. Since overnight rate is cost of holding reserves, higher overnight rate, **fewer reserves demanded**

Open Market Operations

- Open market operations are tools used to change actual quantity of reserves. **Equilibrium in the reserves market determines actual overnight loans rate**
- **Thus,** bank uses open market operations to keep overnight loans rate on target
- **This helps keep inflation on target**

Overnight loans rate and inflation

- When bank buys securities , thus increasing their reserves (**through the BoC lowering overnight interest rate)**,
- Short-term nominal interest rate falls, as supply of money increases due to banks loaning their extra reserves and exchange rate goes down.
- Quantity of money in loans and supply of loanable funds increase. Quantity demanded for loans also increases, due to lower interest rate. Long-term real interest rate falls**.**
- **Fall in rate increases planned expenditure, multiplier increases aggregate demand**
- **Expenditure, investment, and exports increase. Aggregate demand increase, real gdp growth and inflation increase.**
- When bank of canada raises the overnight loans rate, **the opposite occurs**
- Thus, the bank **influences the inflation rate and output gap**

Fluctuations in Three interest rate changes

- Short-term bill rate – generally the same as overnight loans rate
- Long-term bond rate (interest rate paid on bonds issues by large corporations. Is the rate firms pay on loans, and influence investment-purchase decisions, and are **higher than short-term as they are riskier. Rates are generally less volatile)**
- Long-term rates are **generally only loosely connected** to short-term rates, although **they tend to move in the same direction.**
- Overnight loans rate – generally the same as short-term bill rate

Long-term interest rates

- Are influenced by **expectations** of short-term rates and current rates
- Long-term lending or borrowing is a series of short-term lending or borrowing
- **For example,** if the long-term interest rate > expected average of short-term rates, then you should lend long term and borrow short-term and **vice versa**
- **Since people are lending, long-run real interest rate falls.** And the **opposite is true.**

Exchange rate fluctuations

- Exchange rate responds to changes in interest rate due to **interest rate differential**
- **This affects the foreign exchange market. if interest rate differential falls, then demand for Canadian money falls, while supply increases.** This leads to exchange rate going down