WEEK ONE : Macroeconomics and life

The basic insights of economics

Historic background (before the great depression)

- The classic theory of economics suggests that demand will equal supply which is not always the case. When the market is not efficient the supply and demand will have to adjust. The Great Depression contradicted this theory because goods and services and labour markets had surpluses.
    - Keynesian economics (dominate post war policy) : John Keynes (1936) suggests that markets don't need equilibrium to function.

Economics

- It is the study of how individuals, families, firms, governments and other organizations manage their resources. Those resources can be physical and non physical items such as : trees, money, ideas, technology, time and personal experience. Resources are used to create something of value if someone wants it.

There are two fields of study in economics : microeconomics and macroeconomics. Microeconomics studies the way households and firms make decisions + their interactions with the market.Therefore, everyone does what is best for them and their objectives considering the constraints.

Macroeconomics studies the economy as a whole (regional, national and international) : unemployment rates, income growth and inflation. This helps the understanding of economic events and to inform us about policies. Macroeconomists will collect and analyse data to formulate theories, predict the unfolding of economic events and explain how things work.

4 questions that economists ask to break down problems

1. What are the wants and constraints of those involved ?
2. What are the trade offs ?
3. How will others respond ?
4. Why isn't everyone doing it ?

Important concepts in economy

We want to understand the wants and limits, as a society we have limited resources so we have to make choices with what we have.

1. Scarcity : The understanding of how economic agents use resources to satisfy their needs. It's also wanting more than you can get with what is available meaning there is a limit of available resources. In other words, there aren't enough resources to dedicate to your needs. People always have a fixed range of possibilities and in a society there's so much we can produce with what we have. We have to decide how things will be divided among everyone. When you are constrained by time you have to prioritize your time, activities and expenses.

Ex : Someone wants to eat, study and go on a walk, sometimes they can't manage to do all that which means that they have a limit of time or money.

2. Performance of economy : When we study the economy as a whole, we focus on its performance and that's why we need measuring tools to understand the economy.

- **Gross Domestic Product (GDP) :** It is the measurement of national income in dollars of all goods and services produced locally during a specific period of time. Known as the measurement of a country's output, rising output = economic growth.

- **Unemployment rates :** It measures unemployed workers and analyses labour rates in a country which represents the capacity of production and input. If the unemployment rate is high there is a decrease of outputs. We are concerned about unemployment rates with growth stagnation. Consumer price index (**CPI**), measures inflation rates when there's an increase in price (sometimes is acceptable). Rapid rise in inflation may disrupt the saving–investment process. Business cycles are the fluctuations of when output decreases.

- Firms will not want to borrow when the rate of inflation is high because the cost of borrowing increases. Same thing with households because they won't want to save because the future value of their money may be lower.

These tools help us inform and improve policy decisions through **monetary and fiscal policy. Monetary policy** is controlled by the Central Bank to implement money supply and interest rates. When there is a low interest rate, stimulates output and employment but may create high inflation. High interest rates keep the inflation rate low but may decrease output and employment. **Fiscal policy** is controlled by Federal governments to regulate government spending and taxation. When the government spends more and has lower taxes it boosts the output but leads to debt and more inflation.

- Keep the economic output level at a consistent rate with full employment

3. Decision making : When you make a decision you have to compare the tradeoff between benefits and costs which are not always clear. Then comes the opportunity cost which is the value of the next best alternative (opportunity that you give up). It is the value of what you give up to get something else (dollar value). For example, you chose to watch a movie instead of studying.

4. Marginal decision making : Economists assume that individuals will make rational decisions at the margin by comparing additional costs and benefits of a choice. However, they have to ignore past benefits and costs when making a new choice. Keep in mind that sunk costs should have no influence on your next choice.

5. Incentives : Incentives alter the way people make their choices which causes them to act a certain way by changing the tradeoff they face. There are two types of incentives : positive (encourage the choice) and negative (discourage the choice). Nothing happens in a vacuum : changes affect behaviour and the way people respond. For example a change in price.

6. Efficiency : When resources are used in the most productive way to produce goods and services with the greatest total value. We have to constantly look for new ways to produce the things people want (better use of resources). If the economy is efficient that means the resources are allocated properly. There are some factors that disrupt efficiency :
    - Innovation : its too new

- Market failures : business fails to take advantage of opportunities because something prevents them from capturing the benefits of the opportunity. In other words, the market fails to allocate the resources efficiently.
- Intervention : - intervention in the economy means transactions cannot take place the way they normally would
- Goals other than profit : not profitable and sometimes ideas have other benefits other than profit.

Economic problem solving :

- Economic analysis requires combining observations and theory; scrutinizing both before drawing conclusions.

Causation (cause and effect) : One event causes the other but it's not always the case. For example we have to wear coats in winter because it is cold.

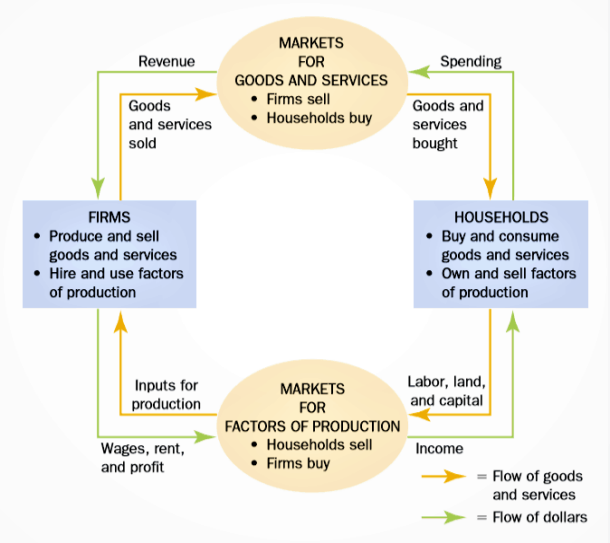
Correlation : A constant relationship between two events ; things that happen at the same time.

- **Positively correlated :** variables increase/decrease in relation to one another (rain and raincoat)
- **Negatively correlated :** inverse correlation. One variable increases and the other decreases (vaccines and virus)
- **Correlation without causation :** events can occur together but are not caused by each other (cold and winter olympics)
- **Omitted variable :** events go together but there is an underlying event causing both events (fire, firefighters, burns)
- **Reverse causation :** When two events go together but we don't know which caused what (umbrella and rain)

Economic models

- Simplified representation of a complicated situation and has 3 characteristics :

1. Shows transactions in an economy



Flow of dollars : Household to firms for goods and services / Firms to households for land, labour and capital

Flow of inputs / outputs : Households supply firms with land, labour, capital (outputs to produce goods and services) / output of firms goes to household

2. Predict cause and effect
3. Clear assumptions (if they do not hold the models are not accurate
4. Approximately accurate

Positive and normative statements : Normative statements are claims about how the world should be (values, morals, prescriptive). Positive statements are factual declarations about how the world actually is. They can be proved false by data and evidence.

Summary

1. Classical thinking dominated economic thought until the Great Depression. Classical theory emphasizes the attainment of market equilibrium by the forces of demand and supply. While the theory was able to explain how markets perform most of the time, it failed to explain the existence of surplus in the labour market during the Great Depression. This led to the development of a new school of thought called Keynesian economics, and it forms the foundation for what is now called macroeconomics.

2. Economists usually assume that people behave rationally and live within a condition of scarcity. Answering the question,What are the wants and constraints of those involved?tells you what to expect from each player in the situation you are analysing. Given rational behaviour and scarcity, you can expect people to work to get what they want (their motivations) using the limited resources at their disposal (their constraints).

3. Trade-offs arise when you must give up something to get something else. AnsweringWhat are the trade-offs?will tell you about the costs and benefits associated with a decision. The full cost of doing something is the opportunity cost. Economists

assume that rational people make decisions at the margin, by comparing any additional benefits from a choice to the extra costs it brings. If people are behaving rationally when they face trade-offs, they will always choose to do something if the marginal benefit is greater than the opportunity cost. They will never do it if the opportunity cost is greater than the marginal benefit.

4. The collective reaction to changing trade-offs is a central idea in economics. AskingHow will others respond? will give you a complete picture of how a particular decision affects the world. You can assume that any action will bring a response, because people react to changes in their incentives.

5. Efficiency occurs when resources are used in the most productive way possible to produce the goods and services that have the greatest total economic value to society. In other words, efficiency means using resources to produce the things that people want. Under normal circumstances, markets are efficient.

6. So when you see what seems to be unexploited opportunity, you should ask,If it's such a great idea, why isn't everyone already doing it?Markets usually allocate resources efficiently. When they don't, a market failure may have occurred, government may have intervened in the economy, there may be goals other than profit involved, or there may be a genuine opportunity for innovation.

7. When there is a consistently observed relationship between two events, we say they are correlated. This is different from a causal relationship, in which one event brings about the other. Three common ways in which correlation and causation are confused are correlation without causation, omitted variables, and reverse causation.

8. A model is a simplified representation of the important parts of a complicated situation. In economics, models usually show how people, firms, and governments make decisions about managing resources and how their decisions interact. The circular flow model is a representation of how the transactions of households and firms flow through the economy. A good economic model should predict cause and effect, describe the world accurately, and state its assumptions clearly. Economists test their models by observing what happens in the world and collecting data that can be used to support or reject their models.

9. A statement that makes a factual claim about how the world actually works is called a positive statement. A statement that makes a claim about how the world should be is called a normative statement. Economics is a field in which people frequently confuse positive statements with normative statements. However, you do not have to adopt a particular moral or political point of view to use economic concepts and models.

Measuring GDP

What is GDP

- The sum of market values of all final goods and services produced within a country in a given period of time. We produce a bunch of goods and services in an economy and we need a common measure for the value of this economic activity. Market prices are used because they reflect the value of goods and services.
    - Regardless of citizenship

The market price in the local currency, for example canadian dollars.

- All final goods and services are products sold legally in the market such as apples and oranges, health care**.** It includes housing services but some items are not included in the GDP because they are difficult to measure like products like items that are produced and consumed at home that don't enter the market (cleaning your own home). However if you hire a cleaning company that would be included in the GDP. Illegal items are not included because we do not report them.

The GDP may underestimate the true amount of economic activity

- Intermediate goods are not counted, which is the value of goods and services that are used to produce other goods and services. Because, the price of the final goods already capture the value of the goods that were used to produce it. If we were to count it separately, its like counting it twice (double counting). However, if the intermediate good has not been used yet it counts as final for the time being and will be counted as inventory.
- Examples of intermediate goods : fruits used to make jam, paper used to make books or the wood used to make furniture. The final goods would be the jam, the paper or the table. That means that only the value of the final good will be counted in the GDP.

- When we talk about goods and services we mean tangible (food, clothing, furniture) and intangible items (haircuts, attending a concert).

- Produced within a country, are the sum of products counted according to the location of production and not in terms of the citizenship of the producer. That would be the gross national product, goods and services owned by the country's residents.

- GDP includes the products currently produced and not items produced in the past like a used car.

- A given period of time means a specific interval of time so annual figures are calculated on a quarterly basis (seasonally adjusted).

How to calculate the GDP

- If we add up the value of all the goods and services in an economy we get the market value of all the output sold. We measure total output by measuring total expenditure, dollars spent by the buyers of goods and services. The dollars spent represent the income to the sellers of goods and services. Production can be

measured by adding up the income received from the production. (income approach). In a closed economy (good produced and sold domestically), national expenditure equals national income.

The expenditure approach

- We divide the GDP in multiple components which represents different types of spending :
    - C + I + G + NX
        1) C = consumption
        2) I = investment
        3) G = government purchases
        4) NX = net exports

1) Spending of goods and services by private individuals and households
    - Goods (durable : appliances, cars, non durable : coffee or food)
    - Services (dentist, haircut, attending a concert)

2) Purchase of goods used to produce other goods rather than consuming (capital goods)
    - Capital equipment (tools and machines)
    - Structures (warehouse)
    - Inventories (goods produced now but sold later), unused intermediate goods
    - New house
    - Does not include stocks or mutual funds

3) Spending on goods and services on all level of governments
    - Salaries of gov workers
    - Street lights
    - Not include transfer payments

4) Exports (purchase abroad of domestically produced goods) - Imports (domestic purchases of foreign goods)
    - Net exports will be positive if exports are greater than imports
    - Net exports will be negative if exports are less than imports

Income approach

- Adds up all the incomes received by people in a country (total income earned domestically).
- Includes: wages earned by workers, interest earned on capital investments, rents earned on land and property, and profits earned by firms
- Wages + interest + rental income + profits + indirect taxes - operating subsidies

Value added approach

- Sums up the value added at each stage of production (value of the output - value - input)
- Useful for thinking about the resale of goods
- Sale of a used car is not counted to GDP but if a service was used to help the resale of that car (car dealership), that service adds value that will be added to the GDP.

Using GDP

- Suppose that GDP increases than its possible that more goods and services are produced and its possible that market prices have increased (sold at higher prices).

- **Real GDP :** Measured at constant prices (prices fixed at some past level) (quantities produced). Real GDP focuses on the output (goods and services valued at constant prices for a specific price)
    - For example, 2010 prices which allows to value the output of an economy for different years using constant prices.
    - 2020 outputs will be valued using 2010 prices
    - P1q1 + p2q2 using the base year

- **Nominal GDP :** Calculated at current prices (prices and quantities of goods and services). Measure of goods and services valued at current prices (no control for prices changes)
    - 2020 outputs will be valued using 2020 prices
    - P1 x Q1 for each good + P2 x Q2 …

The GDP deflator

- Measure of the overall change in prices in an economy using the real and nominal GDP ratio :
    - Base year : deflator = 100, current prices are base year prices (nominal = real GDP).
    - If the prices rise nominal GDP is greater than the real GDP so the deflator will be greater than 100
    - If nominal GDP is smaller than the real GDP the deflator will be less than 100
- GDP deflator = nominal GDP (current year) (year 1) / real GDP (base year) (year 1) x 100

Inflation

- Year to year changes in price rather than an increase over a base year
- Inflation = GDP deflator (year 2) - GDP deflator (year 1) / GDP deflator (year 1) x 100
- In %

GDP per capita (per person)

- How much is produced per person, does not measure quality of education. It measures the average income and not the distribution of income. It does not allow you to know what you can buy with that money in that country.
- Allows us to compare average incomes across countries
- **GDP per capita =** GDP / population size

GDP growth rate

- Track changes in economy overtime and measures percent change in real GDP from one time period to the next (annually or quarterly)
- In %
- GDP growth rate = GDP (year 2) - GDP (year 1) / GDP (year 1) x 100
- Economy grows the growth rate is + when it shrinks the growth rate is -
  Recession : Decline in economic activity
  Depression is a severe and long recession

Limitation and challenges

Home production :

- Not included in GDP and is a major component of economic activity that can change how one country compares to another.
- Goods and services that are produced and consumed within one household
- Cook a meal a home (not counted in GDP but ordering counts in GDP)

Underground economy :

- Transactions that are not reported are not included in GDP, goods and services that are sold outside of official records
- Black market (sales of illegal goods and services)
- Legal goods and services but not reported to the gov

Environmental externalities :

- Some goods are seen to have a negative value attached to their productions such as environmental damage from production (negative output, pollution). Final goods that harm people.
- Negative value is not counted in production or expenditure measure
- Green GDP subtracts the environmental costs of production from positive outputs that are counted in the GDP.

Well being :

- Look beyond GDP

Summary

- Most goods and services go through several production steps and may pass through multiple firms before ending up in the hands of the consumer. However, when calculating GDP, we should consider only the value of the final good or service in order to avoid double-counting. The value added by each step of the production process will be included in the price of the final product.

- The most commonly used variable for measuring the value of a national economy is gross domestic product, or GDP. GDP is the sum of the market values of all final goods and services produced within a country in a given period of time. The goods and services that count toward GDP are defined in terms of the location of production, not the citizenship of the producer. GDP is usually calculated on an annual and quarterly (three-month) basis; only new goods and services being produced within that time period are counted. Quarterly GDP estimates are typically given as a seasonally adjusted annual rate, which projects what annual GDP will be based on the current quarter's output if the economy continues to follow expected seasonal patterns.

- Economists can think about the size of a national economy in three different ways: how much is produced (output), how much is spent (expenditure), and how much income is earned (income). All three of these methods add up to the same thing. Total output is the value of the things produced in an economy in dollar terms, which is the same as the price for which those outputs sell, which is the same as what people spent to buy those outputs. Therefore, the value of output is equal to expenditures. Every transaction has both a buyer and a seller, so expenditures by one person translate directly into income for someone else; therefore, income equals expenditure.

- The expenditure approach to calculating the size of an economy involves adding up all spending on goods and services produced in an economy and subtracting spending on imports. We can break expenditures into four categories:Consumption(C) measures spending on goods and services to be consumed by private individuals and families.Investment(I) includes any goods that are bought in order to produce other goods and services in the future.Government purchases(G) are goods and services bought by all levels of government, for either consumption or investment. Finally,net exports(NX) is foreign spending on domestically produced goods and services minus domestic spending on foreign-produced goods and services. The sum of these categories and the equivalence of income (Y) and expenditure gives us the equationY = C + I + G + NX.

- The income approach adds up the income earned by everyone in a country—including wages (earned by workers), interest (earned on capital investments), rental income (earned on land and property), and profits (earned by firms).

- The Value-added approach accounts for the value that is added at each stage of production in the economy. This approach allows economists to investigate the contribution of each transaction in the economy to overall GDP. It also solves the double-counting problem because only part of the value of each transaction is registered, and it does not register the total price of intermediate goods and services.

- Many countries use all three approaches to calculate GDP so that policy makers and researchers can get a full picture of economic activity.

- GDP is a function of both the quantity of goods and services produced (output) and their market value (prices); an increase in GDP can result from growth in either or both components. To isolate the role of growing output, we can control for price changes.Real GDPis calculated based on goods and services valued at constant prices.Nominal GDPis calculated based on goods and services valued at current prices.

- One way to measure price changes is by calculating the GDP deflator. The GDP deflator summarizes the overall increase in prices in an economy using the ratio between real and nominal GDP in a given year. If prices have risen such that nominal GDP is now higher than real GDP, the deflator will be greater than 100. If prices have fallen such that nominal GDP is now lower than real GDP, the deflator will be less than 100. The GDP deflator allows us to “deflate” nominal GDP by controlling for price changes.

- GDP per capita is total GDP divided by the population of a country. It tells us the average income or productivity per person in the economy. To track changes in an economy over time, we can calculate the real GDP growth rate, measured as the percentage change in real GDP from one time period to the next, typically annually or quarterly at an annual rate. When the economy shrinks the growth rate is negative, and this is one of the major indicators used to determine whether the economy is in a recession or depression.

- GDP is a rough measure of the average standard of living in a country, but does not tell us about the distribution of wealth. Furthermore, three important segments of the economy are not included in GDP by design: home production (goods and services that are produced and consumed within a household); the underground economy (illegal transactions, or legal transactions that simply aren’t reported to the government); and externalities (such as pollution) that are not fully accounted for in regular production or

consumption measures. Higher GDP is often associated with other indicators of higher well-being, such as health, education, and life satisfaction, but does not guarantee those things.

The cost of living

The cost of living

- If all prices and incomes increased at the same rate everywhere in the world tracking the cost of living would be simple accounting.
- Some price changes will matter more to a consumer than others. We seek to understand how much price changes and in what direction. (whether item is big part of total budget)
- Tracking individual price changes over time giving most weight to items that account for the biggest share of a typical consumer's budget. That is how we track the overall cost of living has changed.

Measuring price changes over time

The market basket

- Specific goods and services in fixed quantities that corresponds to a consumer's spending (reflects a change in prices)
- Keeping quantities fixed ensures changes in total cost of the basket due to change in prices.
- Cost of basket in year T = p1q1 +p2q2

This approach is the basket approach, a single number to track changes in cost

The consumer price index (CPI)

- Changes in the cost of living are indicated by a consumer price index. Allows us to measure how the cost of living has changed between locations or overtime.
    - Base year or location

- Measure of overall cost of goods and services bought by a typical household
- It is calculated by Statistics Canada (compares cost of fixed basket of goods and services.
- 8 major components to goods and services
    - Food
    - Shelter
    - Household operations
    - Furnishings and equipment
    - Clothing and footwear
    - Transportation
    - Health and personal care
    - Recreation and education (includes tobacco and alcohol)

- Applications of CPI (inflation, adjust contracted payments, deflator, monitor economic policies, economic research and analysis.

How is it calculated

- Determines the basket of goods and services (what items are bought and in what proportions) of a typical household
- Prices of each good
- Cost of the basket is calculated (different times)
- Designated base year (bench mark, where we can compare other years)
- CPI is calculated

CPI = cost of basket in desired year prices / cost of basket in base year prices X 100

- **In the base year, the CPI = 100**
- **Cost in desired year in price is greater than the cost in base year prices than the CPI is greater than 100**
- **Cost in desired year in price is less than the cost in base year prices than the CPI is less than 100**

- Helps us understand the change in cost of living overtime

The challenges in measuring price changes

- Which goods and services do we include in the basket, no perfect basket
    - Spending of a typical household
- Change in quantity and quality
- The basket contains goods of unchanging and equivalent quality and quantity
- Quantity adjustment is a type of quality adjustment that considers change in package sizes (may require an adjustment in price)
- Change in people behaviour
    - People may substitute a good for another because it becomes more expensive so they buy less of it
- People's consumption may change because of innovation, so the basket has to be updated to continue to reflect the spending of a typical household.

Typical is based on

- Urban consumers
- Does not include rural areas, ppl in military institutions.

GDP deflator (overall change of prices in a economy) vs CPI

- Both are used to look at overall changes in level of prices
- Deflator
    - prices of all goods and services produced domestically
    - Compares prices of currently produced goods

- CPI
    - Prices of goods and services bought by consumers
    - Compares a fixed basket of goods and services

Using price indexes

- Price indexes allow us to isolate changes in price from changes in fundamentals (income/output) and expresses it in constant $ related to base year.

Inflation rate (year to year)

- Can be calculated by using the CPI
- Percent CPI change from year to year
- Inflation rate = CPI year 2 - CPI year 1 / CPI year 1 x 100

- Two measures using CPI
    - **All items inflation :** Changes in price for the entire market basket of the average urban consumer. (entire basket)
    - **Core inflation :** Price changes using 8 of the CPI's most volatile components are taken out of the basket. (fruits and veg, gasoline, tobacco products) (because prices change)

Producer Price Index (PPI) - prices of goods/services purchased by firms

- **includes things not part of usual consumer basket**

How does the price index deflate nominal variable

- Current value (y$) = past value(x$) X (CPI year y / CPI year x)
- Purchasing power and compare income overtime
- Theories say that with time wages should naturally rise to offset effects of inflation.
    - Income of 20 000 in 1990 compared to income of 25 000 in 2020 ?

Adjusting for inflation

- **Indexation :** Automatically increases payments in proportion to the cost of living (indexed to inflation).
    - Wages to CPI
    - Cost of living adjustment
    - Canada pension plan and old age security
    - Keep value of payments roughly constant over time through automatic adjustment

Accounting for price differences across locations

- We need to adjust economic variables for price changes overtime and sometime to adjust for differences in prices across locations.

Purchasing Power Parity (PPP)

- In theory, should be the same everywhere when stated in a common currency

Why might it not hold ? (in reality it usually does not)

- **3 main reasons**
  - Transaction cost (takes time and money to find sellers across)
  - Non tradables (some goods cant be moved easily, like appartements)
  - Trade restrictions (make exchanges between countries difficult of costly, tariffs)

To compare between countries we use Purchasing Power Indexes

- Construct price index to describe differences in price across different location
- It shows how much a market basket costs in different countries relative to a base year country
- Measures price of the basket of goods in each country and finds the overall basket purchase cost in each country
- Builds index showing basket cost in each country relative to an established base.
  - Challenge : people in different places buy different goods, so it's difficult to construct a market basket that would reflect the cost of living in different places.

PPP adjustment

- Differences in the level of prices across countries
- PPP adjusted value = nominal value in country A x 1 / 1+ price level adjustment in country A)
- Can be + or -
  - Depends if the purchasing power of the country in interest is higher or lower than the purchasing power in country A.

Summary

1. To understand how the overall cost of living has increased, we need a way to measure the combined change in the prices of multiple goods, whose individual prices may be changing at different rates. To accomplish this, we can construct a market basket that includes specific goods and services in fixed quantities. By keeping goods and quantities constant, we can be sure that any change in the total cost of the basket is caused by a change in prices, rather than the type or amount of things being consumed.

2. To summarize changes in price levels, we can construct a price index, which measures how much the cost of a market basket has risen or fallen relative to the cost in the base year or location. The most commonly used tool for measuring the cost of living in Canada is the Consumer Price Index, or CPI. It tracks the cost of a basket of goods and services that is representative of the purchases of Canadian households. The price index in a given year is equal to the ratio of the cost of the market basket in that year to the cost in the base year, multiplied by 100. In the base year, the index will always be

100. In future years, if the price of the basket rises, the index will be more than 100. If the price of the basket falls below that in the base year, the index will be less than 100. An index of 120 implies a 20 percent increase in price levels over the base year.

3. Statistics Canada faces two major challenges in constructing a basket: how to decide which consumption should be measured and how to account for changes in consumption over time. To deal with the first challenge, the CPI is based on an average of the goods and services purchased by urban consumers. It also presents two broad measures of this basket: all-items inflation (another term for the CPI) and core inflation. Core inflation measures price changes for the CPI market basket, but with food and energy costs taken out. Removing those costs may miss a large part of the inflation picture.

4. The second challenge comes from changes to consumption and products over time. If the market basket doesn't change to reflect the substitutions consumers make as prices change, it will overstate the effect due to the rising prices. Finally, in trying to measure changes in the standard of living, economists need to tease out differences between mere changes in prices of products versus changes in quality as a result of innovation and technological advances.

5. The inflation rate describes the size of changes in the overall price level year to year. It is calculated by measuring the percent change in a price index from one year to the next. All-items inflation measures the changes in prices for the entire market basket of urban consumers.Core inflation measures price changes with food and energy taken out.

6. Inflation estimates based on the CPI measure price changes paid by consumers. Estimates based on the Producer Price Index (PPI) measure the prices of goods and services purchased by firms. Estimates based on the GDP deflator measure price changes for everything produced within a country (and thus exclude imports). Unlike the CPI and PPI, estimates based on the GDP deflator do not use a fixed basket of goods. In practice, inflation rates based on the CPI, PPI, and GDP deflator track each other quite closely.

7. One of the most important applications of price indexes is the ability to be able to determine the purchasing power of money from a different time period. This gives the power to see the value of what a certain amount of dollars from the past could buy today, or how much a certain amount of dollars today would have been worth in the past. To translate a current amount from year X into a past amount in year Y, multiply the current value for year X by the ratio of the CPI of year Y divided by the CPI of year.

8. Indexing is an important application of the need to adjust nominal values into their real purchasing power. Recognizing that the purchasing power of money changes over time, payments and pay cheques can be automatically indexed to inflation, so that their

purchasing power stays equal even as prices change. Indexed payments are often referred to as cost-of-living adjustments.

9. Purchasing power parity (PPP) is the idea that price levels in different countries should be the same, once they have been stated in a common currency. For a number of reasons—including transaction costs, non-tradable goods and services, and trade restrictions—PPP doesn't typically hold true; the real purchasing power of a dollar differs from place to place.

10. When we recalculate economic variables to account for differences in purchasing power across countries, we say that we are calculating PPP-adjusted variables. To measure this difference in purchasing power, we can calculate a price index by comparing the cost of purchasing a market basket in each country. If the cost of living is lower than the base country, then PPP-adjusted GDP will be higher than nominal GDP. If the cost of living is higher than the base country, then PPP-adjusted GDP will be lower than nominal GDP.

Unemployment and the labour market

Defining unemployment

- Statistics Canada defines people aged 15 and older. There are 3 categories :
    - **Employed :** In the reference week, its people who have worked (payed or profit) or had a job and were absent.

- **Unemployed :** When someone wants to work but cannot find a job (no paid work or self employment).In the reference week, they are available for work, on temporary layoff, looked for work in the past 4 weeks or had a job to start in the next 4 weeks.
    - Unemployment rate varies by educational status, gender, age and race.

- **Not in the labour force :** In reference week :
    - Unwilling or unable to offer supply labour services under the conditions existing in their labour markets
    - People who are neither employed or unemployed

Measuring unemployment

Data on unemployment

- Statistics Canada computes many statistics to summarize the labour market through a survey of 54 000 households.

The labour force

- People in the working age population who are employed (working or absent from job) or unemployed (available for work, waiting to start a job, temporary layoff).

The working age population

- Everyone aged 15 + (civilian and non institutionalized) except people in armed forces and institutions. These people are available for work and are making efforts to find a job.

The unemployment rate
- Unemployment rate = number of unemployed / labour force X 100
- Indicates the labour force % that is unemployed
- Either entire population or certain groups (age population or different location)

The labour force participation rate
- Labour force participation rate = labour force / working age population X 100
- Indicates the fraction of the population that is employed or unemployed

The employment rate
- Employment rate = number of employed / working age population X 100
- Fraction of the population that is employed
- Either entire population or specific groups

Challenges with interpreting unemployment measures :
- Unemployment often used to summarize labour market
- Unemployed (available for work and looking for work, temp layoff, waiting for a job)
- Not in the labour force (unable or unwilling to work)
- Not all employment results in the person finding a job so they may leave the labour force

Discouraged workers : They are not included in unemployment (people without work) However, they have looked for work in the previous year but gave up due to the labour market conditions.

Underemployed persons : People who have part time jobs but would like to work full time : those overqualified for the positions they hold.

Equilibrium in the labour market
- Labour demand and labour supply curves intersect forming a labour market of people willing to buy and sell labour.
- Market is at equilibrium when stable wage price and amount of labour are bought and sold.

- When people are willing to supply more labour than firms are willing to hire, the labour market has a surplus of workers, which is also known as unemployment.

Natural rate of unemployment
- Rate of unemployment that the economy tends towards in the long run, normal rate of unemployment that persists.
    - Equilibrium rate of unemployment

Contributors of natural rate of unemployment
1. **Frictional unemployment**
    - Results from the process of matching workers and jobs
    - Takes time for workers to find jobs suitable for their tastes and skills.
    - Caused by workers changing their job, location or career
    - Sometimes it is unavoidable, always happening

2. **Structural unemployment**
    - Occurs when there's a mismatch between workers skills and the skills in demand
    - Not enough jobs for everyone who wants one and is suited for the job
    - Skills of workers and jobs available do not always match

3. **Real wage or classical unemployment**
    - Wages are above equilibrium wage
    - Surplus labour because the quantities of labour supplied exceeds the quantity of labour demanded
    - Price floor in the labour market creates surplus labour.

    - The wages can be above the equilibrium for the following reasons :
        - **Minimum wages** : Lowest a firm can legally pay its workers. When the minimum wage is binding (wage is above equilibrium, than the quantity of labour supplied with be greater than labour demanded). = surplus of labour.
- Many jobs are going to be paying above minimum wage so for them the minimum wage would not be binding. In that case minimum wage wont explain unemployment rate. (only for lowest paying jobs)

Unemployment rate stays the same. Since the equilibrium wage is above the government-mandated minimum wage, the minimum wage will not be binding. Firms will already be paying above the set minimum wage, and therefore, the minimum wage will have no effect on the wage paid or the unemployment rate. (if the number in question is smaller)

Unemployment rate will increase. Since the government-mandated minimum wage is above the equilibrium wage, in this case, the minimum wage is binding. The wages paid to workers will rise, but so will the unemployment rate (if the number in question is bigger) .

- **Unions :** When a union bargains and succeeds in raising wages above the equilibrium than the quantity of labour supplied will increase and the demanded labour supply will decrease.
    - So workers who are employed and are members of the union are better off with higher wages. Those higher wages are not beneficial for the unemployed workers. We don't know if unions are good or bad for the economy as a whole.

- **Theory of efficiency wages :** Firms operate more efficiently when wages are above the equilibrium because :
    - **Worker turnover :** The more the firm pays the workers the less they are likely to quit. Firms save on cost of workers turnover (interviewing and training new employees).
    - **Worker productivity and effort :** High wages may encourage workers to work harder because workers are eager to not lose their jobs. High wages could mean healthier workers who are less more productive .
    - **Worker quality :** Offering higher wages can attract the best job applicants and workers.
        - Also debated by economists

Cyclical unemployment (short term fluctuations in economic activity)
- Fluctuations in unemployment around the natural rate of unemployment

- Related to economic ups and downs, referred to business cycle

When the economy is growing

- Unemployment tends to decrease as firms are expanding their operations, they need more workers

When the economy is slowing

- Unemployment tends to increase as the demand for labour falls
- Explained by ‘’ wage stickiness’’, slow to respond to changes in the economy

Public policies and other influences on unemployment

- **Employment insurance :** Government program in which unemployed people are offered and income. However this has an effect on the natural rate of unemployment through frictional and structural unemployment (ambiguous effect, either increase or decrease unemployment).
    - Increase unemployment if it allows people to take more time to find a job and so people can be unemployed for longer.
    - Decrease unemployment if people can find a job that is more suitable for them.
    - Reduces unemployment if it reduces the chance of people leaving or losing jobs.

- **Taxes :** Lower taxes would be an incentive to find work because workers keeps more of income.

- **Workers rights :** The ease of which firms can fire employees so if its difficult to fire employees it can affect firm hiring decisions.

Summary

- To be considered unemployed a person needs to meet three conditions: (1) be part of the working-age, civilian population; (2) not have worked in the week surveyed; and (3) be available for and actively looking for work. Economists measure unemployment with the unemployment rate.This is the number of people who are unemployed, divided by the labour force. The labour force participation rate is the fraction of the working age population that is working or looking for work. People who are not working but who are not actively looking for work—for example, students, homemakers, or discouraged workers—are not considered part of the labour force. Those, on the other hand, who are working at jobs that don’t fully use their skills or knowledge are considered to be underemployed. The employment rate is the fraction of the working age population that is employed

- .Like other markets, the labour market features a demand curve and a supply curve. The total demand for labour from all the firms in the economy is represented by the labour demand curve. On the whole, firms will want to hire more labour when wages are cheaper and less labour when wages are high, which means the labour demand curve slopes downward. The total labour supply is represented by the labour supply curve. We would expect that people will be willing to supply more labour at higher wage rates, and less labour at lower wage rates. This relationship gives the labour supply curve a positive slope. Equilibrium in the market for labour is reached at the wage (price of labour) where the labour demand and labour supply curves meet. Unemployment results when the market wage rate remains above the market equilibrium; it is effectively a surplus of labour at the inflated wage rate.

- We think of the economy as having a long-run natural level of unemployment. This natural rate of unemployment is the amount of unemployment that is unavoidable in a dynamic economy. There are three reasons we expect the economy to have some unemployment when everything else is normal: Some unemployment is frictional, such as when people change jobs or locations. Some unemployment is structural, such as when people are unemployed because of a mismatch between the skills demanded by firms and the skills the labour force has, perhaps as the result of developments in technology. Some unemployment is known as real wage or classical unemployment, which can be the result of minimum wage legislation, the bargaining power of unions, and efficiency wages .

- Some unemployment is related to changes in GDP. When GDP is higher than normal, unemployment is lower than the equilibrium rate. When GDP is lower than normal, unemployment is above the equilibrium rate. This type of unemployment is called cyclical unemployment.

- Many factors affect the level of wages. Three reasons the wage rate may not fully adjust to the equilibrium wage rate in the labour market are: (1) a legal minimum wage that is above the equilibrium wage rate; (2) labour unions that negotiate a wage rate above the equilibrium wage rate; and (3)efficiency wages(wages paid by firms that are above the equilibrium wage rate).

- The design of employment insurance programs is ultimately a balance of trade-offs. When benefits are not generous, losing a job can become a devastating financial hardship, but when benefits are too generous, incentives to actively search for a job are diminished. In Canada, unemployment benefits last only a short time and pay only a fraction of people's average working wages so as to minimize the incentive to shirk the job search

Economic Growth

- Increased personal productivity leads to increased per capita income

Real GDP per capita growth rate

- Economic growth is measured by the Real GDP per capita growth
- Real GDP per capita growth rate = nominal GDP growth rate - inflation rate -population growth rate
- If the nominal GDP is growing faster than population growth and faster than inflation rate together then the real GDP will increase. This means that the purchasing power of a typical person will increase meaning that they can buy more goods and services.

Compounding

- Economic growth builds on itself overtime, it can lead to substantial changes even if it's small (seemingly small growth rates).
- Real amount in year A = real amount year b (1 + growth rate) ^(a- b)

Example : If we want to forecast real GDP per capita in 20 years

Real GDP per capita in 20 years = real GDP per capita today (1 + 0.02)^20

We can also look at the rule of 70, to approximate the time it takes for an amount to double :

- Years until the amount doubles = 70 / real growth rate
- The time it takes for real GDP per capita to double - growth rate to % would be about 35 years.

Determinants of productivity

- Standard of living : driven by average productivity of its people.

Productivity drives growth : It can be measured in different ways but is referred to as the quantity of goods and services that a worker can produce. (output / worker). This is the same as GDP per capita meaning that a country's income will depend on the productivity of its workers.

- If productivity increases then the income per capita increases. This implies that there will be economic growth.

Factors that determine a worker's productivity

1. **Physical capital (capital)** : Sum of all stock of equipment, structures and tools that are used to produce goods and services. If a worker has access to these things then he can produce more, better and accurately.
    - **To calculate the capital we have to add up the value of all the equipment, tools and structures in the economy.**
    - **New physical, old physical will be needing replacement through investment (coming from household savings). Savings determine future productivity.**

2. **Human capital :** This refers to knowledge and skills that workers acquire during training, education and experience. Human capital contributes to economic growth by increasing workers productivity. This means that workers can produce more with the same amount of physical capital. It can be enhanced through investment, schooling and training but can deteriorate through unemployment and skills are outdated.

3. **Natural resources** : Inputs to production that come from nature (trees and water). They take two forms :
    - **Renewable resources :** Replenished naturally overtime (trees and water)
    - **Nonrenewable resources :** Limited supply and once depleted they cannot be replenished (coal and oil).

We tend to assume that countries with resources are wealthier which is not always the case. Some poorer countries can also be abundant in resources.

4. **Technology** : This refers to the understanding of the best way to do things. So better technology allows more goods and services to be produced. It allows workers to produce

more goods with the same amount of human and physical capital. Technology can take various forms :

- Common knowledge (technology that everyone is aware of)
- Proprietary (known to the firm and those who are responsible for it). It is possible that the knowledge will be only exclusive to that company for a limited amount of time.

5. **Rates versus levels** : The factors that determine the level of income are not necessarily the same factors that determine future growth

Accounting for growth (capital, labour, technological growth will all contribute to growth in output)

- Growth accounting equation : Allows us to see the changes in inputs to production and how they result in a change in output.

Gy = Ga + xgk + (1-x)gl

- Gy : growth rate of output (observable)
- Ga : growth rate of technology (not observable)
- Xgk : growth rate of capital (capital share)(observable)
- (1- x)gl : growth rate of labour (labour share) (observable)

For example, it allows us to understand how an increase in capital and labour leads to an increase of outputs.

We rearrange the equation to solve for growth rate of technology :

- Ga = Gy - xgk - (1-x)Gl

Convergence (catch up effect) : Initially poorer countries grow faster than initially richer countries more (grow slowly). Countries tend to converge at the same rate of growth and will allow poorer countries to catch up).

- Poor countries will grow faster than rich ones, until they catch up.
- All countries “converge” at the same growth rate, even if not at the same income
- Starting poor is not a guarantee of achieving impressive growth rates

Diminishing marginal returns to capital : If we add one more unit of capital than there will be an increase in output. This means that if the country has a large stock of capital that is used to produce goods and services then the additional unit of capital is going to increase productivity less than adding for a country with less stock.

- By more when capital stock is low vs by less when capital stock is high.

Growth and public policy (how it can influence productivity)

1. **Investment and savings :** An increase of physical capital will produce more goods and services. We have to invest in physical capital to increase productivity. However there is a trade off involved because resources are scarce. Give up some consumption today for higher future production and consumption.

Investment trade off

- Reduction in current consumption to pay for the investment in capital intended to increase future production/consumption

2. **Funds to pay for investment : Governments can invest tax revenues in capital or focus national resources on promising industries.**

    - Within the country (domestic savings and governments)
      - Savings that come from within a country; domestic income minus consumption spending

    - From abroad (foreign direct investment). This means that that capital investment is owned by a foreign company. Firm runs some operations abroad or invests in a company abroad.

    - Foreign portfolio investment (investment financed through foreign funds but operated domestically).

    Policies can be aimed to increase domestic savings or investment from abroad. Some of the investment will go back to foreign countries.

3. **Education** :
    - Investment in human capital
    - Policy to encourage growth needs to provide access to education

4. **Health and nutrition**
    - Policies can encourage growth by investment in health of the population (healthier workers are more productive).
    - Education and healthcare are conducive to investment

5. **Property rights and good government**
    - Policies can lead to stability, protection of property rights that are important for growth.
    - Instability and insecurity are discentives to invest.
    - Effective government and stability in leadership and institutions are important to investment and trade

Poverty

- National poverty is a main justification for foreign aid that provides loans or funding for infrastructure and human capital development.

Environment

- Environment concerns can affect pursuit of economic growth.

6. **Economic openness**
    - Most economists believe that outward oriented policies will promote economic openness (integration to economy, free trade).
    - Government must be open to trade

7. **Technology**
    - Policy will encourage technological development (to promote growth) through :
        - Funding in research
        - Education system
        - Patent systems
        - Tax structures that encourage research development

Summary

- The fact that growth compounds over time makes it hard to tell just from looking at the annual growth rate what the total effect on incomes will be. GDP growth rates are often stated without taking population growth into account and sometimes without taking inflation into account. To find the rate of real GDP growth, take the nominal growth rate and subtract both population growth and inflation growth rates.

- National economic growth builds on itself over time. The result is that a relatively modest annual growth rate, like 2 percent, actually adds up to quite a large total growth rate over time. The rate at which GDP increases incomes can be found through therule of 70: to find how long it takes incomes to double within a country, divide 70 by the rate of real GDP growth.

- The only way that a country can consume more and enjoy a higher standard of living is to increase its productivity—the amount it produces per worker. Productivity can be measured for any unit of labour, whether that unit is an hour of time worked or how much one worker produces; it is typically measured as output per person. The factors that influence labour productivity are physical capital, human capital, technology, and natural resources.

- There are two important distinctions to make in terms of economic development. One is about the level of well-being. Countries like Canada or Switzerland that have very high amounts of physical and human capital are said to be at a high level of development. The other distinction is about the rate of economic growth. While Canada may have a

high level of development, the rate of growth in Canadian GDP is not nearly as fast as China's. Level matters because it tells how wealthy a country currently is. Rates matter because they tell how quickly a country is increasing its wealth.

- The growth accounting framework is a way to explain the growth rate of GDP as the sum of the growth rate of technology plus the growth rates of capital and labour, weighted by their shares of output. The framework helps us see how much of growth is due to suing more inputs (capital and labour) versus using existing inputs more efficiently (via technology).

- While labour and capital are relatively straightforward to measure, it's much harder to measure technology. Fortunately, the framework gives a way to estimate the importance of technology in economic growth by calculating it indirectly as a residual. The evidence shows that technology (defined broadly) is often extremely important in explaining growth.

- Convergence theory predicts that countries that are starting at lower levels of income will grow at a faster rate than those starting at higher levels, until they catch up and converge to the same growth

- In some ways, convergence theory fits evidence from the real world. The four East Asian countries that experienced incredible growth since the 1960s started from low levels of physical and human capital, but were well positioned to take advantage of technologies and capital flows from wealthier countries. However, most African countries had similar or even lower levels of physical and human capital than did East Asia half a century ago but have not experienced high growth rates.

- Countries face an investment trade-off, in which they must reduce current consumption to pay for the capital investment needed to increase future production. Funds to pay for capital investment can come either from domestic savings or from foreign direct investment (FDI) from outside the country.

- A variety of policies can promote economic growth. Education teaches skills such as literacy, basic math, and communication, which are essential to perform more than the most elementary jobs. Education is also a way to develop the training and skills that countries need in order to undertake technological research and development. Public health systems can also contribute to growth by increasing the portion of the population that is fit, healthy, and able to work. Public policy can also encourage technological development through the education system, funding for research and study, and tax structures that encourage firms to develop and adopt new technologies

- Enforceable laws and effective, trustworthy government services are critical to a well-functioning economy. The most important is the provision of property rights, giving people the ability to have control over the resources they own. Most countries have

institutions and infrastructure that are at least partially designed to protect these property rights. Courts enforce the contracts between buyers and sellers. They also are responsible, through the criminal justice system, for punishing people who are accused of violating the property rights of others.

Aggregate expenditure

- depressions and recessions are puzzling
- people willing to work at the prevailing wage can't find a job
- firms can supply more output, but there isn't enough demand
- workers lose jobs, machines are idle, inventories accumulate and output falls sharply People suffer

The components of aggregate expenditure

- **When economies face downturns, both spending and production fall.**
  - GDP can be calculated by aggregating all expenditure in the economy

- $Y = C + I + G + NX$

Y = Aggregate expenditure
C = Consumption
I = Investment
G = Government spending
NX = Net exports

Factors that affect consumption

- How much is spent on the consumption of goods and services, and the choice to consume now or later.

1. **Current Income**
   - People consume more with more income

Marginal propensity to consume (MPC)

- Constant fraction of incremental disposable income spent on consumption
- Current income and Current consumption are + related
  - So an increase in current income increases consumption
  - A decrease in current income decreases consumption
- MPC = Change in consumption / Change in disposable income
  - amount consumption increases when after-tax income increases by $1

2. **Wealth**
   - **wealthier households tend to spend more; increased wealth leads to more consumption**
   - Value of assets or resources held by people (saving and bonds)

- Wealth and consumption are + related
    - Increased wealth increases consumption
    - Decrease in wealth decreases consumption

- **MPC** tends to be lower for wealthier households, smaller amount spent on consumption

3. Expected future income

- + related to consumption
- "smooth consumption over time" - keep spending fairly steady even as income rises/falls
- expected future income influences current consumption similarly to current income
- If people expect their incomes to rise in the future they tend to spend more today (increase in consumption) and if they expect a fall they tend to spend less today (decrease in consumption).

4. Interest rates

- Price of borrowing money and saving money
- determines the financial return on saving and the cost of borrowing (real interest rate - interest rate adjusted for inflation
- Consumption and interest rates are - related
- Higher interest rates encourages savings and discourages borrowing which decreases consumption
- Lower interest rates discourages savings and encourages borrowing, increases consumption

Factors that affect investment (includes spending on houses and inventory)

- **changes in capital, including changes in machines, structures, software, residential housing**
- **investment often requires borrowed capital**

1. **Expectations about profitability**
    - + related with investment
    - More + expectations are going to encourage firms to invest and negative expectations will discourage investment.

2. **Interest rates**
    - - related to investment
    - When interests rates are high they will discourage investment by discouraging borrowing
    - Lower interest rates encourage investment

3. **Business taxes**
    - Higher business taxes reduce investments and lower business taxes increase investment

Factors affecting government spending

- Determined by the government and not affected by macroeconomic factors
- spending based on beliefs about what citizens need or as a way to stimulate or restrain the economy (fiscal policy)
- includes only direct purchases of goods and services, not transfer payments
- transfer payments are often negatively correlated with aggregate income

Factors that affect Net exports (value of exports - imports)

- the value of goods and services sold to foreign consumers minus value of goods and services purchased domestically from foreign producer

1. **Domestic income**
    - income earned by those living within a country
    - Domestic income rises then so does consumption
    - more consumption generally leads to more purchases of imports along with increased purchases of domestic goods and services
    - more imports mean net exports decrease (because imports are subtracted out in the calculation of net exports

    - When domestic income increases it will decrease net exports as imports increase.
    - When domestic income decreases it will increase net exports as imports are decreasing.

2. **Foreign income**
    - **income earned by those living outside a country**
    - **increases in foreign income tend to increase exports (positive relationship)**
    - Foreign income increases it will increase net exports when exports increase
    - Foreign income decreases it will decrease net exports when exports decrease

3. **Exchange rates**
    - **value of goods in one country expressed in terms of the same goods in another country and currency conversion**
    - Real exchanges rates increase than net exports decreases (domestic goods are more expensive)
    - Real exchange rates decrease than net exports increases (domestic goods are less expensive)

4. **Tastes for foreign goods**
    - **people find foreign goods more attractive than previously; domestic consumption shifts toward imports, decreases net exports**
    - Increase in taste of foreign goods will decrease net exports when imports increase.

- Decrease in taste of foreign goods will increase net exports when imports decrease.

5. **Trade policies**
    - Depends on the policy
    - reflected in exchange rates and other macroeconomic variables rather than influencing the level of net exports directly
        - analyzed on a case-by-case basis to determine effect on net exports

Aggregate expenditure model

Autonomous expenditure

- not affected by the current level of income in the economy
    - changes when aggregate income changes
    - baseline level consumption insensitive to income
    - to simplify things and focus on the most important macroeconomic relationships, treat net exports as autonomous expenditure

1. **Actual aggregate expenditure**
    - **amount of new investment and actual inventory changes**
        - inventory change included in investment; firms draw down existing inventories, actual inventory investment is negative and vice versa

    - **Y = C + I + G + NX**

2. **Planned aggregate expenditure (spending plans)**
    - **PAE = C + I^p (planned investment) + G + NX**
    - Captures firms investment plans (amount of investment that firms want to make)

What if :

Plans = Actual

- **PAE** = actual aggregate expenditure = Y = National income = Total output

Planned investment :

- amount firms actively decide to put into new capital resources and inventory
    - can differ from actual investment; changes in aggregate demand affect inventory fluctuation

- Inventories count as investment
- When firms sell more or less than intended than inventories will be more or less than planned. This means that actual investment can be more or less than planned
- Actual investment can differ from planned investment
- Actual aggregate expenditure (y) can differ from planned aggregate expenditure (PAE)

PAE = A + by

- A = constant that captures other factors, autonomous expenditure
- B = MPC , positive coefficient that relates spending to national income
  - Slope
  - response of planned aggregate expenditure to changes in income
- Y = national income

Y1 is greater than PAE 1

- Actual inventories are greater than planned inventories. Firms have more inventories than they wanted, so they sold less than they anticipated. Firms are going to respond by reducing production.
- So output falls, shift to the left

PAE 2 is > than Y2

- Planned inventories exceed actual inventories meaning that firms sold more than planned. Firms respond by increasing production. Actual output rises, shift to right

  PAE = Y
  - Equilibrium aggregate expenditure
  - Firms are selling as much as planned and will have no incentives to change production

Importantly this model assumes :

1. Prices and wages are fixed
2. Equilibrium aggregate expenditure may not be the full employment level
   - Equilibrium (aggregate expenditure) can be above or below full employment level
   - Recessionary output gap : economy operates below
     - when equilibrium aggregate expenditure is below the level needed for full employment
   - Inflationary output gap : economy operates above full employment level
     -

The multiplier effect

- increase in consumer spending when spending by one person causes others to spend
- increases impact of initial spending on economy •initial consumer (autonomous) spending ripples through the economy such that the overall change in output (induced spending) is larger than the initial change in autonomous expenditure
- Change y = change A X (1 / 1 - b)

Summary

- Other than the price level, there are a number of factors that affect the current level of aggregate consumption in an economy. Current income and consumption are positively related through the marginal propensity to consume. The levels of wealth and

consumption are positively related. Expected future income and consumption are positively related. Interest rates and consumption are negatively related

- Other than the price level, there are a number of factors that affect the current level of planned investment in the economy. Expected future profitability and investment are positively related. Interest rates and investment are negatively related. The level of business taxes and investment are negatively related. There is a relationship between the levels of saving and investment in an economy, but there doesn't have to be perfect parity between the two when government budgets aren't balanced and international trade is present

- The level of government spending on goods and services in an economy is an explicit policy choice and therefore is not directly determined by macroeconomic factors. That said, macroeconomic factors may enter into the policy discussion in an indirect fashion

- Other than the price level, there are a number of factors that affect the current level of net exports in an economy. Domestic income and net exports are negatively related. Foreign income and net exports are positively related. Exchange rates and net exports are negatively related. Tastes for foreign goods and net exports are negatively related. Trade policies can have an effect on net exports, but the analysis of the relationship must be done on a case-by-case basis since increases and decreases are not always well defined

- Autonomous aggregate expenditure refers to expenditure whose level is independent of the level of current income in the economy. For the purposes of the equilibrium aggregate expenditure analysis, we assume that all categories of expenditure other than consumption are autonomous

- Planned aggregate expenditure is the sum of consumption, planned investment, government spending, and net exports, while planned investment is the level of investment in productive capital and strategic inventory accumulation that firms choose before aggregate expenditure is realized. Actual aggregate expenditure, by definition, is equal to aggregate output and income, and it is the sum of consumption, actual investment, government spending, and net exports. Actual investment includes not only planned investment but also unexpected investment in the form of accumulation of unsold inventory or decumulation of existing inventory. Graphically, the relationship between actual and planned aggregate expenditure results in an upward-sloping curve with a slope equal to the marginal propensity to consume.

- The aggregate expenditure equilibrium model is important because it shows how an economy can persist at a level of output that deviates from full-employment potential GDP. Specifically, the model explains how recessionary expenditure gaps can occur where equilibrium aggregate expenditure is below what is needed to sustain potential GDP. In addition, the model explains how inflationary expenditure gaps can occur where

equilibrium aggregate expenditure is larger than what is needed to sustain potential GDP. Lastly, the model explicitly shows how the different parts of the model come together to create the multiplier effect of initial changes in aggregate expenditure.

- The determinants of the components of aggregate expenditure show that there is a circular relationship between current income and current consumption: current income is a determinant of current consumption, but current consumption is also a determinant of current income. Therefore, any initial change to a determinant of aggregate expenditure is going to flow through to this consumption/income cycle. The result is an overall impact that is larger than the initial change. This overall impact can't be infinitely large, however, since the effect of the initial change on aggregate expenditure gets smaller with each iteration of the cycle.

Aggregate demand and aggregate supply

Aggregate demand and aggregate supply model

- The model describes the economy in terms of overall price level and output, prices, employment and output are linked.

Aggregate demand (Y = C + I + G + NX)

- downwards sloping curve, represents the overall price level and total goods and services demanded.
- This all else equal fall in the economy overall price increase the total quantity of goods and services demanded where an increase of price reduces the total quantity of goods and services demanded.
- Output is expressed by its components (consumption, investment, governments spending (fixed and determined by policy), net exports)

Aggregate demand

- total demand for all goods and services in the economy

Aggregate demand curve

- relationship between the overall price level and level of demand in economy

Consumption and the overall price level

- **If wages increase equals prices increase, purchasing power of stays the same**

1. **Wealth effect :** decrease in price level makes consumers feel wealthier so they are encouraged to spend more (increase in demand of goods and services). An increase price level makes consumers feel less wealthy so they are encouraged to spend less (decrease in demand for goods and services).
    - Once wages adjust this effect is no longer applicable, in other words if wages fall along with prices, then consumers are not feeling wealthy so they do noy spend more, no increase in demand).

Investment and the overall price level

1. **Interest rates :** The lower the price level, it holds less money which allows people to invest more (buy bonds, savings) then lowers the interest rates. It allows firms to borrow and invest more because this encourages borrowing. (increase of goods and services demanded)

The higher the prices are, it holds more money and people invest less so higher interest rates result in a lower quantity of goods and services demanded.

- As prices rise, the price of borrowing also tends to rise; more expensive to borrow for investment

Government spending and the overall price level

- Does not contribute to the downward slope of the aggregate demand curve because we assume that it is fixed and is determined by policy.
    - even when prices fluctuate, much of government spending must continue

Net exports and the overall price level

1. **Real exchange rate** : Decrease in domestic price level, means that domestic goods and services are less expensive relative to foreign (increase exports and reduce imports, increase of net exports which increases the demand in goods and services).
    - Real exchange rate depreciates, where domestic goods can be traded for foreign goods.

An increase in domestic price levels then domestic goods and services will be more expensive than foreign (decrease in exports and increase in imports, net exports decrease) (decrease in quantity of goods and services demanded.

- The real exchange appreciates

These all provide an explanation as to why the aggregate demand curve has a downward slope.

- These four categories describe all the ways that people can spend in the economy
- The relationship between price level and quantity of goods and services demanded causes a downward slope (negatively related) because of :
    - Wealth effect
    - Interest rates
    - Real exchange rates

- demand curve can shift in response to non-price changes in any of the four components of aggregate demand

Aggregate demand : Movement along the curve (1) vs shift of curve (2)

1. Caused by a change in price level

2. Caused by a change in other factors other than price level
    - Consumption, investment, government spending, net exports
    - Changes the quantity of goods and services at a given price

curve can shift left or right in response to non-price changes in any of the four components of aggregate demand which make aggregate demand rise/fall at any given price.

- market confidence and government policy can shift demand curve

Shift of curve : Factors other than price

Consumption

1. **Taxation :** tax cuts are going to increase consumption and will shift the curve to the right (AD increases). Tax increase will reduce consumption and AD decreases.

2. **Expectations about the future :** More optimism is going to increase consumption and will increase AD (shift to the right) as less optimism will have the opposite effect.

Investment

1. **Future business conditions :** More optimism will shift the curve to the right (AD increase) as less optimism will shift the curve to the left (AD decrease)

2. **Tax policies** : Shifts AD but will depend on the policy as it can also decrease it (either ot the right or to the left).

Government spending

- So changes to government spending will shift AD
- The multiplier
    - each dollar of expenditure in economy leads to more than a dollar of output

Net exports

1. **A recession in a foreign country :** This will reduce exports which reduces net exports decreasing AD and a shift to the left.

2. **Trade and currency exchange :** Depends on the change (shifts AD) either to the left or to the right.

Aggregate supply

- Relationship between overall price level and quantity of goods and services supplied.
- Relationship between the overall price level in economy and total production (output)
    - similar to market supply curve, with two key differences:

1. represents production in the economy as a whole rather than just one good or service
2. macroeconomic level - difference between how the economy operates in the short run and how the economy operates in the long run

Short run (1)

- Hourly, daily, weekly
- This curve depicts the relationship between price level and the quantity of goods and services supplied in the economy in the short run (upward sloping curve)

Long run (2)

- However long it takes for prices of inputs to fully adjust (rent, raw material and wages)
- Focuses on quantity
- This curve depicts the relationship between price level and the quantity of goods and services supplied in the economy in the long run (vertical line)

Short Run

1. **Price level and quantity of goods and services supplied**
    - Increase in price level will increase the quantity of goods and services supplied
    - Decrease in price level will decrease the quantity of goods and services supplied
    - Final prices increase faster than input prices supplied because some prices are sticky

Sticky prices

- Slow to adjust to changes in the economy due to contracts and malpractices for exemple.
- When prices increase, not all input prices increase immediately; some are sticky, meaning that they adjust slowly in response to changes in the economy
    - contracts and practices make wages and the prices of other inputs stick
    - Final goods prices are rarely dictated by contract

Supply shocks

- significant events that directly affect production and the aggregate-supply curve in the short run

Misperceptions

- People notice changes in prices in individual markets. For example, a seller of bread is going to notice an increase in the price of bread so he will respond by increasing its production in the short run (rather than noticing the overall price change in the economy).

Long run

2. **Price level and quantities of goods and services supplied**

- Prices fully adjust
- Once prices fully adjust, prices will increase which means that the cost for firms are going to increase as input prices increase as all prices increase. This means that firm costs will increase and once prices fully adjust than production will go back to where it started. (vertical curve)
    - Production is not determined by price level

- some costs fixed because the quantity of an input cannot be adjusted in the short run; others are variable.

- macroeconomics considers how long it takes for prices to adjust through the whole economy, rather than the flexibility of quantities within an individual firm

- long-run aggregate supply curve represents potential output in the economy

1. Potential output : Price does not determine long run output but is determined by labour, capital,natural resources and technology.

- Level of output that the economy tends towards in the long run

Shifts to long run aggregate supply

Ex : Increase in capital, new energy source, tech innovation will increase the potential output and shift the curve to the right.

On the other hand, things like climate change, aging population will reduce the potential output or shift the curve to the left.

Shifts to short run aggregate supply

- Everything that shifts long run aggregate supply will shift the short run aggregate supply but not the opposite.
- People expectations about prices, cost of production, supply shocks will affect the short run

Business cycle

- fluctuations of GDP either above or below the potential level of GDP in the economy
    - **Boom** : output is higher than potential output : intense demand for labour/capital during booms drive prices upward
    - **Recession** : output is below potential :ramping up production is easier; lower costs.

Aggregate demand and aggregate supply

- Short run equilibrium : AD = SRAS
- Long run equilibrium : AD = LRAS = SRAS

Economic fluctuations and the role of policy

Equilibrium

- In the national economy is the point at which aggregate demand equals aggregate supply.
- short-run equilibrium is given by the intersection of aggregate demand and short-run aggregate supply curves
    - shocks can alter equilibrium

Economic fluctuations

- when people buy more, aggregate demand curve shifts out
- results in a new short-term equilibrium at point E2
- at this new equilibrium, output and prices are higher.
- Wages and prices increase due to the shift in aggregate demand, more costly to produce goods, so the short-run aggregate supply curve shifts to the left
    - this brings production back to its original level, but prices increase again

    - when aggregate demand shifts left due to a decrease in a component of aggregate demand; new short-term equilibrium moves to point E2
        - at point E2 both prices and output are lower

- Lower prices of inputs make it cheaper for firms to produce goods; aggregate supply curve shifts out
    - **shift restores the economy to a long-run equilibrium with the same original level of output, but with lower price**

Economic fluctuations

- **Temporary supply-side shocks - only SRAS curve shifts**
    - **permanent changes - LRAS and SRAS curves shift**

Stagflation

- output decreases while prices increase
    - successful economic policy hinges on being able to discern between a demand shock and a supply sho

Event Vs What kind of shock?

1. **Temporary increase in the price of oil**
    - Negative short-run supply shock

2. **Technological innovation**
    - Positive long-run supply shock

3. **Drops in consumer confidence**
    - Negative demand shock

4. **Sudden increase in immigration**
    - Positive long run supply shock

Economic fluctuations

supply or demand?	Positive shock	Negative shock
Demand side	**Short run :** - Output and price increases	**Short run :** - Output and price decreases
Demand side	**Long run :** - No change in output - Price increases	**Long run :** - No change in output - Price decreases
Temporary shock : supply side	**Short run :** - Output increases - Price decreases	**Short run :** - Output decreases - Price increases
Temporary shock : supply side	**Long run :** - No change in output or price	**Long run :** - No change in output or price
Permanent shock : supply side	**Long run :** - Output increases - Prices decreases	**Long run :** - Output decreases - Price increases

Role of public policy

- In a crash of the stock market, aggregate demand drops sharply, shifting the curve in
    - new short-term equilibrium has lower prices and output

- If government increases spending in response to the housing crash, aggregate demand will shift back out
    - new equilibrium is at a higher level of prices and output, but still below the levels under the long-term equilibrium

Summary

1. The aggregate demand and supply model captures the relationship between prices and output in the economy. It comprises two parts: the aggregate demand curve, which shows the relationship between the price level and total demand in the economy, and two aggregate supply curves, which show the relationship between the price level and the total supply in the economy. The aggregate demand curve can be traced out by graphing how equilibrium planned aggregate expenditure changes as the price level changes.The aggregate demand curve is downward-sloping because consumption, investment, and net exports all decline when the price level rise.

2. Since the aggregate demand curve is derived from the definition of GDP (Y = AD = C + I + G + NX) anything that affects any of the components of GDP will shift the aggregate demand curve. For example, if government spending increases, the aggregate demand curve will shift out; if net exports decrease, the aggregate demand curve will shift in. When the aggregate demand curve shifts, there will be a short-run change in output, but no long-run shift in output. The price level will change in both the short run and the long run.

3. When the government increases spending, it sets into motion a series of additional rounds of expenditure in the economy. Each time aggregate expenditure increases, disposable incomes go up and households respond by spending more. The increased spending causes another round of increased aggregate expenditure, and the process continues.

4. With taxes, the story is similar. A reduction in taxes increases disposable income, triggering a chain of higher spending, increased incomes, and further spending. There is, however, an important difference between the impact of taxes and government spending. Whereas government spending increases aggregate expenditure dollar-for-dollar in the first round of the multiplier process, a portion of the tax cut gets saved. Thus, the multiplier associated with a given dollar value of tax cuts will tend to be smaller than the multiplier associated with the same dollar increase in spending.

5. If the prices of inputs change, the entire aggregate supply curve will shift. Any change that makes production more expensive for firms will shift the supply curve in (to the left). Any change that makes production cheaper for producers will shift the aggregate supply curve out (to the right).

6. Factors that can affect output include new technologies, improved transportation systems, management innovations, and so on. Anything that affects the output possible using these factors will shift the long-run aggregate supply curve. If the potential output of the economy expands, the long-run aggregate supply curve will shift to the right. If the production possibility frontier for the economy contracts, the long-run aggregate supply curve will shift to the left.

7. When there is a positive shock in aggregate demand, prices and output increase in the short run. Eventually, input prices and wages catch up to the increase in the price level. The SRAS curve slowly adjusts to the left. In the end, this adjustment further increases prices while decreasing output. The final result is that output falls back to its original level and prices are higher than originally. For a negative shock, the aggregate demand shifts to the left. Prices and output fall. The adjustment of the SRAS curve to the right brings output back to its original level, but prices fall even further.

8. The aggregate supply curve is a relationship between total supply in the economy and price level. Anything that affects the factors of production or the level of technology will affect both the long-run aggregate supply curve and the short-run aggregate supply curve; this shift is a permanent supply shock. Anything that affects the prices of inputs or the costs of doing business will affect the short-run aggregate supply curve, but not the long-run aggregate supply curve; this shift is a temporary supply shock. When there is a temporary supply shock, the price level and output changes in the short run but not in the long run. When there is a permanent supply shock, both the price level and output change in the long run.

9. In reality, we do not observe aggregate supply and demand curves shifting. Instead, what we see are changes in output and the price level. With the help of the AD/AS model, we can infer whether the changes in the economy were more likely to have been caused by a shift in supply or demand and whether the shock was temporary or permanent. A situation where output falls and prices rise is likely due to a backward shift of the aggregate demand curve. If, however, output falls and prices rise, it's likely that the culprit is an upward shift in aggregate supply. Temporary shifts in demand and supply do not cause permanent changes in output and prices. Permanent shifts leave output unchanged, but they can lead to permanent changes in the price level. If, for instance, there is a permanent upward shift in the supply curve, long-run output will eventually return to potential, but prices will be permanently higher.

10. Depending on the type of shock, the government can choose to increase or reduce government spending in response. The government often chooses to act because action is preferable to waiting for the economy to adjust after a shock. Shortfalls in aggregate demand can be corrected by increasing spending. The same is true of aggregate demand, although the government might want to be careful in this situation. Regardless of the shock, increases in government spending will produce higher prices in the long run.

Fiscal policy

- Government spending and taxes, so those changes will affect aggregate demand
- Has an influence on aggregate demand both directly and indirectly
- government decisions about the level of taxation and public spending
    - affects the economy by increasing or decreasing aggregate demand; attempts to smooth fluctuations

Changes to government spending

Direct

- An increase in government spending will increase aggregate (shift to the right) demand as a decrease in government spending will decrease it (shift to the left).

Indirect

- An increase in government spending, the multiplier effect will increase the effect of aggregate demand.
- An increase in government spending, crowding out effect will reduce the effect of aggregate demand.

Crowding out effect

- An increase in government borrowing will lead to a decrease in private borrowing. So in an increase in government spending will increase interest rates and crowd out private investment.

Changes to tax policy

Directly

- A reduction in taxes will increase consumption and aggregate demand creating a shift to the right.
- An increase in taxes will reduce consumption and aggregate demand creating a shift to the left.

Indirectly

- Crowding out effect, reduces the effect on aggregate demand as the multiplier effect will increase the effect on aggregate demand.

Expansionary fiscal policy

- Aims to increase aggregate demand by increasing government spending or reducing taxes.
- Overall effect of decisions about government spending and taxation intended to increase aggregate demand
    - - government spends more; shifts AD curve to right
    - Amount of the shift depends on the spending

Contractionary fiscal policy

- Aims to reduce aggregate demand by reducing government spending or increasing taxes.
- Overall effect of decisions about government spending and taxation intended to decrease aggregate demand

With a decrease in aggregate demand the AD curve shift to the left

- New equilibrium, prices and output will be lower than before

Fiscal policy

- In overheating economy, prices and output are above the long-run equilibrium in the economy
- To slow down the economy, government spending can cut spending or raise taxes, shifting the AD curve leftward.
- Prices and output fall although the economy is still above long run equilibrium

Fiscal policy choices often amount to no more than educated guesses, made without the benefit of all the relevant information

- in democracy, policy must be debated and voted
- time lags in policy decisions and implementation can mean sometimes it's too late to do any good

Policy response to economic fluctuations

- Fiscal policy is used as a tool in response to economic fluctuations to stabilize the economy (recession or booming to move it back to its long run potential).

Real world challenges

- **Lags in the policy making process**

1. **Information lag**
    - It takes time for information about the economy to become available, time to collect data (inflation, unemployment, GDP).

2. **Formulation lag**
    - It takes time to formulate policy and to decide which policy to use and for it to be approved.

3. **Implementation lag**
    - It takes time to implement the policy and for its effects to reach and move through the economy.

These lags can cause the economy to correct itself and those policies are no longer suitable as a response. These lags can be avoided through :

1. **Automatic stabilizers**
    - Changes in fiscal policy that affect aggregate demand without deliberate action from policy makers.

2. **Discretionary fiscal policy**
    - Change in fiscal policy, in which there is a deliberate choice of how to act by policy makers.

Examples

1. **Taxes as an automatic stabilizer**
    - During a recession, the amount of taxes (income profits) collected fall, people's tax obligation falls too (lower tax brackets). They will pay a smaller amount of tax, encouraging spending (expensionnary).
    - If the economy is booming, the amount of income profits increase which means people will find themselves in higher tax brackets, paying more (discourages spending (contractionary).
    - Income tax system designed so people pay higher tax earnings rise

2. **Government spending as an automatic stabilizer**
    - During a recession, unemployment will rise and so will spendings on programs (expansionary) but when it is booming unemployment falls so spending on programs is reduced (contractionary).

Ricardian equivalence

- A rational individual should respond to a decrease in taxes by increasing saving to pay for expected higher future taxes.
- If this theory holds, reducing taxes will not be effective in increasing aggregate demand.
- theory predicts if governments cut taxes but not spending, people will not change their behavior
    - government will have to borrow money to cover financial shortfall from cutting taxes
    - future tax increases will be required

The government budget

Revenue

- Tax revenues

Spending

- Government purchases and transfer payments

Budget deficit (tends to increase in a recession)

- If spending is greater than revenue
- amount of money a government spends beyond the revenue it brings in

Budget surplus

- If spending is less than revenue
- amount of revenue a government brings in beyond what it spends

spending increases can lead to larger deficits, but so can decreases in tax revenues

- During recession, government spending often increases as part of an expansionary fiscal policy (and due to automatic stabilizers); revenues tend to fall because people are earning and spending less

Public debt

- Government debt is the sum of all past budget deficits minus the sum of all past budget surpluses.
- total amount of money government owes at a point in time; increases with deficit
- Expressed as share or % of GDP
- Borrowing from private sectors and foreign government

Debt : cumulative sum of all deficits and surpluses
Deficit : how much the government revenues fall short of spending each year

Borrow by selling treasury securities to individuals and other governments (used to finance government spending)

- variable term loans to government with specific pay-back date, sold to people

1. **Treasury bills**
    - Short term : sold for a price and carry a promise for a specified amount to be paid on a later date.
    - Sold by the government

2. **Treasury notes (2, 3, 5, 7, 10 years) and bonds (30 years)**
    - Longer time and pay interest

3. **Real return bonds**
    - Protected against inflation

Benefits of government debt

- Flexibility in response to unexpected events
- Allow investment that encourages economic growth

Direct cost of debt : depends on the interest rate
indirect costs of government debt : can distort the credit market/slow economic growth

- crowd out private borrowing; increases the demand for credit, increasing the price of credit

Costs of government debt

- Interest payments
- Crowding out private investment by increasing interest rates

Summary

- Together, the level of taxation and government spending is called fiscal policy. We say that fiscal policy is either expansionary or contractionary.

- Expansionary Fiscal policy involves changes to fiscal policy that cause the aggregate demand curve to increase (shift out to the right). It is expansionary because it expands aggregate demand. Expansionary fiscal policy occurs either because government spending increases or the level of taxation decreases and is a response to recessionary conditions.

- On the other hand,contractionary fiscal policy involves changes to fiscal policy that contract aggregate demand, causing the aggregate demand curve to decrease (shift in to the left). Contractionary fiscal policy occurs when government spending decreases or when taxation increases, and is a response to an overheating economy with the accompanying threat of excessive inflation.

- The government can use fiscal policy to counteract business-cycle fluctuations. When the economy is sluggish, the government can conduct expansionary fiscal policy to stimulate demand. This will lead to a faster recovery than without the fiscal policy. On the other hand, if the economy is overheating, the government can undertake contractionary fiscal policy to reduce aggregate demand. This action also returns the economy closer to the long-run equilibrium level.

- Time lags can mean that sometimes a fiscal policy choice is too late to do any good. Time lags come in many forms. There are information lags (how long it takes to get the right information about the overall health of the economy),formulation legs (getting everyone to agree on the right policy), and implementation lags (how long it takes fiscal policy to have an effect on the economy).

- To get around time lags, automatic stabilizers can affect fiscal policy without specific action from policy-makers. These features of government policy can automatically stimulate or slow the economy

- The tax system is designed so that people who earn more income should pay higher average tax rates. One consequence is that when the economy is booming, people move into higher income ranges, which means they automatically face higher tax rates. The automatically increased taxes have a contractionary effect by slightly checking overall spending and aggregate demand. When the economy is in a recession, people move to lower income ranges, which have lower tax rates. The automatically reduced taxes have an expansionary effect, encouraging spending and spurring aggregate demand.

- Government spending can also work as an automatic stabilizer.When the economy is booming, fewer people are eligible for employment insurance benefits and welfare programs; government spending on those programs falls, reducing aggregate demand

and having a contractionary effect.In a recession, more people are eligible for these programs and spending on them automatically rises, increasing aggregate demand and having an expansionary effect.

- Ricardian equivalence predicts that if governments cut taxes but not public spending, people will recognize that the government will have to borrow money to cover the financial shortfall that's been created. People will then figure that, at some point in the future, taxes will have to go back up to repay the extra government debt incurred through tax cuts. Since people see that a tax cut today will just mean higher taxes in a few years (or maybe decades), they are reluctant to spend so freely after the tax cut. The theory says that, as a result, tax cuts will have no impact on spending: people will continue to save rather than spend, consumption will not increase, and the tax cut will be unsuccessful in changing aggregate demand.

- Recent empirical evidence, however, shows that people do spend extra when taxes are cut, increasing aggregate demand. Ricardian equivalence is an important theoretical idea, but the data show it is not a good guide to predicting the actual effect of tax cuts.

- The government budget includes all of the revenue it collects in taxes and all of the money it spends on government programs. When the government spends more than it collects in revenue, it runs a deficit. When it collects more revenue than it spends, it has asurplus.In most years, the government spends more than it collects in revenue.Deficits tend to increase during recessions and, more generally, when spending rises and tax revenues fall.

- Deficits occur when annual spending is more than annual revenue. A surplus occurs when annual spending is less than annual revenue. The public debt is the total amount of money that the government has borrowed over time. The debt and the deficit are closely related: the budget deficit tells us how much the government borrows each year, and the debt tells us the total that the government has borrowed and not yet paid back over time. In other words, the debt is the cumulative sum of all deficits and surpluses.

- The government borrows money from others by sellingTreasury securities, which are debt-financing arrangements made by the Canadian government with obligations to pay back the money over varying lengths of time (often a year or less, but sometimes as long as 30 years). Individuals, other governments, and banks, both abroad and in Canada, purchase Treasuries as financial investments. They are typically seen as relatively safe investments, and investors around the world flocked to these during the Great Recession and its aftermath.

- A deficit allows the government to spend more than its revenue. Allowing the government to run a deficit permits the government to respond to unexpected events and to undertake expansionary fiscal policy. However, there are also costs of running deficits. Interest needs to be paid on the debt, the government may not spend the money

efficiently, and high government deficits may affect interest rates and reduce investment in the economy.

Traditional markets in goods and services are relatively straightforward; they help to match prospective buyers with those willing to sell.

The financial system

- brings together savers and borrowers in a set of interconnected markets where people trade a variety of financial products
    - markets , institutions, assets

1. **Financial market :** People trade future claims on funds or good
    - Connect funds of savers with people who want funds

2. **Information asymmetry :** When one participant in a transaction knows more than another participant

Functions of the financial system

- **Financial intermediaries :** Channel funds from people who have them to people who want them (between buyers and sellers)
    - Have funds (sellers and savers)
    - Need funds (buyers and borrowers)
    - Indirectly connect funds of savers to borrowers
    - Commercial and investment banks
    - Part of financial institutions

- **Liquidity :** Measure of how easily a particular asset can be converted quickly to cash without much loss of value
    - an asset is liquid if it can be sold for cash quickly without much loss of value and illiquid (not sold easily for cash) if it can't

- **Diversification :** Process by which risks are shared among many, reducing risk impact on any individual
    - Risk is shared among assets or people
    - Idiosyncratic risk : specific asset or company
    - Market or systemic risk : shared broadly

- **Equity :** Financial assets that represent partial ownership (share in profits, dividends), stocks

- **Stock :** Financial asset that represents partial ownership of a company
    - Share in profits

Stocks and bonds

- Investment
- Issuing stock = equity finance
- Selling bonds = debt finance

- **Loan :** agreement in where lender gives money to a borrower who promises to repay the amount loaned plus an agreed-upon amount of interest

- **Bond** (fixed-income securities) : Promise by bond issuer to repay loan at a specified maturity date and pay periodic interest at a specific percentage rate
    - Debt, promise to repay at specific date and pay periodic interest
    - Credit risk by default

- **Derivative :** Asset whose value is based on (or "derived from" value of another asset
    - Derivatives : Value is derived from another asset (future contract)

- **Investment banks :** Don't take deposits or make loans
    - provide liquidity to financial markets by acting as market makers
    - help companies issue stocks and bonds by guaranteeing to buy any that remain unsold (process known as underwriting)

- **Mutual funds :** Portfolio of stocks/assets, managed by a professional making decisions on behalf of clients

- **Pension fund :** Professionally managed portfolio of assets intended to provide income to retirees; two main categories of pension funds exist :
    1. **Defined-benefit plans :** Fixed payout to employees who have met certain entry requirement
    2. **Defined-contribution plans :** Do not guarantee defined level of pension; pay defined amount each year; employers may match some portion

- **Entrepreneurs (borrowers) :** Often looking to borrow money to finance their latest ventures
    - Individuals and firms : borrowing for investment

- **Speculator :** Anyone who buys and sells financial assets purely for financial gain

Basics of finance

- **Adverse selection :** When buyers and sellers have different information about the quality of a good or the riskiness of a situation.

- **Moral hazard :** Tendency for people to behave in riskier ways or to renege on contracts when they do not face the full consequences of their action

- **Whole financial system:** Banks, investors, insurance companies, stock exchanges and government agencies intermediate between savers and borrowers,provide liquidity,and diversify risk

Valuing assets

- basic trade-off in valuing any asset is between risk and return; a high risk needs chance of a high return
- Bonds :
    - Lower risk and return

- Stocks :
    - Higher risk and return

1. **Market (systemic) risk :** Any risk broadly shared by the entire market or economy
2. **Idiosyncratic risks :** Unique to a particular company or asset
3. **Standard deviation :** Measure of how spread out a set of numbers is; high standard deviation indicates data points are more spread out

Predicting returns

- Upon prediction of future profits, use interest rates to translate between the present value and future value of money

1. **Net present value (NPV) :** Measure of current value of cash flows expected; “correct” price of shares
2. **Technical analysis :** Ignores attempts to predict future profits/calculate NPV; analyze past movement of stock’s price to predict future movement
3. **Efficient-market hypothesis :** Market prices use all available information to represent true value
    - Incorrectly price stocks is impossible
    - Market prices - incorporate all available info - true value - future prices cannot be predicted

Bubbles : Asset prices rise or fall beyond what is historically justified
Arbitrage : Taking advantage of market inefficiencies

National accounts approach

- **Savings - investment identity**
    - **Private savings :** Savings of individuals/corporations within a country
        - Savings always equals investment in an economy with no governments and no trade; holds only in closed-economy (domestic trade)

- **Open economy :** Economy interacts internationally
    - With government
    - Investment + net capital flows = national savings

- **Closed economy :** No government
    - Income
        - Investment
        - Consumption x2
        - Private savings
        - Investment + consumption = consumption + private savings
        - Investment = Private saving

- Income
    - Investment
    - Consumption
    - Gov spending
    - Consumption
    - Private savings
    - Taxes

Investment + gov spending = private spending + taxes - public savings
Investment = private savings + taxes - gov spending (- + deficit and surplus)
Investment = national savings

- **Capital outflow :** Money saved domestically invested in another country
- **Capital inflow :** Savings from another country finance domestic investment

Market for loanable funds

- Market in which savers, with money to lend, supply funds to those who want to borrow for their investment spending needs.
    - **Loanable funds :** Dollars on the table between them to be loaned out and borrowed
    - **Supply :** Savings
    - **Demand :** Borrowing for investment

The interest rates is the price received for saving or the price for borrowing

The market for loanable funds graph

- **Savings (supply)**
- Upward sloping curve
- Higher interest rates = Greater quantity of dollars saved (supplied)

Demand (investment)

- Downward sloping curve
- Higher interest rates = lower quantity of dollars demanded (borrowed)

Price of money : Usually called the real interest rate

- Typical market for loanable funds is at equilibrium where savings intersects investment
- Determine equilibrium interest rate (r*) and the amount of money traded in the market (Q*)

Determinants of savings

- **Savings :** Portion of income that is not immediately spent on consumption of goods/services
- Savings decisions reflect trade-off faced between spending now or saving, including factors of :
    1. Wealth : Richer households tend to save more
        - Upward shift = increase in savings
        - Downward shift = decrease in savings
    2. Economic conditions
        - Better = increase in savings
        - Worse = decrease in savings
    3. Expectations about future economic conditions
        - Pessimistic : increase in savings
        - Optimistic : decrease in savings
    4. Uncertainty
        - Upward shift : increase in savings
        - Downward shift : decrease in savings
    5. Borrowing constraints
        - Deficient : increase in savings
        - Easy : decrease in savings
    6. Social welfare policies
        - More benefits : decrease in savings
        - Less benefits : increase in savings
    7. Culture
        - Depends

Determinants of investment

- **Investment :** Portion of income that is not immediately spent on consumption of goods/services

- supply of loanable funds comes from savings; demand for loanable funds is from investment

- based on trade-off between potential profits that could be generated by investment and cost of borrowing money for that investment considering :
    1. expectations about future profitability and future economic conditions
    2. Uncertainty
    3. changes in the government's budget deficit

- investment decisions are affected by external forces that determine supply of loanable funds/interest rate

There is single interest rate that is paid by all prospective borrowers; rates affected by two factors :

1. **Length of time :** Lenders want to be compensated for the opportunity cost of being unable to get their money back quickly
    - **Degree of risk :** is borrower dependable

- **Default :** Borrower fails to pay back a loan according to the agreed-upon term
- **Risk-free rate :** Interest rate at which one would lend if there were no risk of default

Expectations about the future :

- Optimistic : increase in borrowing
- Pessimistic : Decrease in borrowing

Uncertainty

- Upward shift : decrease in borrowing
- Downward shift : increase in borrowing

Government deficit

- Increasing borrowing : shift to the right
- Decreasing borrowing : shift to the left

Crowding

- **Increase in gov borrowing = decrease in private borrowing**
- **G increase or T decrease**
- **Increase in demand for loanable funds**
- **Increase in interest rates**

Summary

1. A financial market is one in which people trade future claims on funds or goods. Financial markets help ensure that the world's wealth is channeled to the individuals and organizations that can most effectively take advantage of it. A well-functioning financial market matches buyers and sellers as efficiently and effectively as possible. In financial markets, buyers are people who want to spend money on something of value right now, but don't have cash on hand. Sellers are people who have cash on hand and are willing to let others use it, for a price

2. An information asymmetry arises when one participant in a transaction knows more than another participant. Adverse selection and moral hazard are two types of information asymmetry problems of financial markets.Adverse selection refers to a state that occurs when buyers and sellers have different information about the quality of a good or the riskiness of a situation, and this asymmetric information results in failure to complete transactions that would have been possible if both sides had the same information.Moral hazard refers to people's tendency, after a transaction takes place, to behave in a riskier way or to renege on contracts when they do not face the full consequences of their actions

3. Financial markets—including banks, which are one example—serve three main functions.First, they act as intermediaries, bringing together savers and borrowers in an easy, one-stop clearinghouse. Second, they provide the benefits of liquidity—having cash easily available when you want it—without the downsides of holding cash. Third, they help savers to diversify risk by providing funds to a big pool of borrowers. No individual saver will bear the full burden of a failed loan or investment
4. The market for loanable funds is a hypothetical marketplace that brings together everyone looking to lend money (savers) and everyone looking to borrow money (anyone with investment-spending needs). The market for loanable funds clears at a price where supply and demand meet. This price is known as the interest rate. A key determinant of the supply curve for loanable funds is how much people decide to save.Economists differentiate between savings and investment: savings is the portion of income that is not immediately spent on consumption, whereas investment is spending on productive inputs.

5. Many factors influence the supply and demand curves for loanable funds. Factors that determine how much people save include wealth, current economic conditions, expectations about future economic conditions, borrowing constraints, social welfare policies, and culture. Factors that determine investment decisions include expectations about future profitability and future economic conditions, borrowing constraints, and crowding out (reduction in private borrowing that is caused by an increase in government borrowing

6. Two basic factors drive differences in interest rates: length of time and degree of risk. Lenders generally want a higher interest rate to compensate for the added opportunity cost when loans stretch over a long period and for taking on additional risk. The interest

rate at which one would lend if there were no risk of default is the risk-free rate(generally approximated by interest rates on government debt). In the market for loanable funds, loans with longer terms and higher risks of default will have interest rates further above the risk-free rate

7. Financial systems provide features similar to financial markets: intermediating between savers and borrowers, providing liquidity, and diversifying risk. In financial systems, various institutions act as financial intermediaries, channelling funds from people who have them to people who want them. Intermediation in financial systems reduces transaction costs by centralizing information about prices and providing a broad and dynamic marketplace for transactions. Various players in the financial system are liquidity providers, helping ensure that markets are liquid. Some of these we even call market makers because they are always ready to buy or sell assets. The very structure of financial assets such as stocks and bonds also serves to increase liquidity. Liquidity is important because it affects people's willingness to save. Finally, the financial system spreads risk even more broadly than a financial market does: savers can diversify into different savings products and across geographic areas; borrowers have access to loans from the funds provided by many more savers.

8. The major types of financial assets are debt and equity. Equity is ownership in a company, and the most common form of such ownership is stock. As partial owners, stockholders are entitled to receive a portion of a company's profits, in the form of dividends, in proportion to the size of their ownership.

9. The most basic type of debt is a loan. Loans are an agreement between a lender and a borrower in which the lender lends money to the borrower in exchange for a promise to repay the amount loaned (the principal of the loan) plus an agreed-upon amount of interest. A bond is a loan that has been standardized into a more easily tradable and liquid asset. Bonds are a type of debt, issued by corporations or governments, as a way to borrow large sums of money. Stocks and bonds are liquid assets that are easily bought and sold in financial markets

10. financial contracts based on the value of some other asset represent a special category of financial assets, called derivatives. The best example of a derivative is a futures contract

11. There are many different players in the financial market. There are banks, which can be divided into two categories: commercial banks and investment banks. When you make a deposit at a bank, or get a mortgage or student loan from a bank, you are interacting with a commercial bank. Investment banks focus on providing liquidity to the financial markets themselves, by acting as market makers, helping companies to issue stocks and bonds (a process known as underwriting)

12. Individual actors in the financial market have to operate through a proxy—they give their money to someone else to invest for them. These proxies include mutual funds (professionally managed portfolios of stocks and other assets), pension funds (professionally administered portfolios of assets intended to provide income to retirees), and life insurance policies (in which people pay premiums that pay out to dependents upon the death of the insured). Entrepreneurs and businessmen are also major players in financial markets, as are speculators

13. In general, there is a direct relationship between risk and reward in the financial market. The riskier the investment, the higher its potential return. Typically the investments with the lowest risk—and lowest return—are government bonds. Stocks are a considerably more risky investment, but also offer the possibility of higher returns. Two different types of risk exist for financial assets—market risk (risk that is broadly shared by the entire market) and idiosyncratic risk (risk unique to a particular asset or company). A portfolio of assets can help diversify away idiosyncratic risk; a certain amount of market risk remains in all portfolios.

14. In financial markets, the most commonly used method of measuring this risk is a simple tool borrowed from statistics: the standard deviation. The standard deviation is a measure of how far apart a set of numbers is in a distribution

15. The efficient-market hypothesis holds that markets are efficient—that market prices incorporate all available information, and as a result, accurately predicting stock returns is impossible

16. Supporters of the efficient-market hypothesis describe the expected movements of a stock as a random walk, a term from statistics that describes any variable (like the price of a stock) that moves in a completely unpredictable (random) way from one moment to the next. Those who argue against market efficiency suggest that some people simply have better information than others or a better ability to put all the complex pieces together to predict stock price. Occasionally markets have certain information inefficiencies that savvy investors, through arbitrage, can exploit to profit from the differences between prices in different markets

17. In a closed economy, one with no international trade, citizens can consume or save. The amount of savings within an economy is necessarily the amount of investment that can occur. Thus, savings and investment spending (the supply and demand of the financial markets) are always equal, a relationship called the savings–investment identity

Money

- Set of all assets regularly used to directly purchase goods and services
- serves three major functions: it is a store of value, a medium of exchange,and a unit of account

1. **Store of value**
    - represents a certain amount of purchasing power that lasts over time
    - Transfers purchasing power from present to future

2. **Medium of exchange**
    - can use it to purchase goods and services
    - Transfer of money from buyer to seller for goods and services

3. **Unit of account**
    - standard unit of comparison
    - Used to measure economic value

Money

- bank note has practically no intrinsic value; accepted because we know that everyone else values them too
- acceptance comes largely from the fact that dollars have stable value

1. **Commodity - backed money :**
    - any form of money that can be legally exchanged for a fixed amount of an underlying commodity

2. **Fiat money :**
    - money created by rule, without any commodity to back it. (Fiatis a Latin term that roughly translates to “it shall be.”)
    - Backed by trust

Characteristics of money

1. **Stability of value :** Value of money should remain fairly stable
2. **Convenience :** Money should be fairly convenient

Making money

- **Fractional reserve banking : less than 100 % kept in reserve**
- **100 % reserve banking : bank does not influence the supply of money**

- **Demand deposits :** funds held in bank accounts that can be withdrawn (“demanded”) by depositors at any time without advance notice; asset/liability for bank
    - **Asset :** a resource the bank possess
    - **Liability :** an amount the bank owes

- **Reserves :** cash that a bank keeps in its vault
- **Desired reserves :** Amount bank desires to keep on hand to meet withdraw demand from depositors
    - Reserves required by bank for demand by depositor

- **Required reserves :** Minimum reserve required

- **Excess reserves :** Reserves in excess of requirements

- **Reserve ratio :** calculated as amount of cash kept as reserves divided by total demand deposits
    - Fraction of deposits kept on reserve

- As money goes into bank and is loaned out again, new money is created
- All money loaned out is eventually put back into the banking system

- **Bank run :** many depositors withdraw deposits thinking bank might not able to satisfy demand

- **Fractional-reserve banking :** banking system where banks keep on reserve less than 100 percent of their deposits (reserve ratio is less than 100 percent)

- **Money multiplier :** ratio of money created by lending activities to the money created by the central bank
- **New total supply of money :** triangle money supply = triangle reserves X money multiplier (1 / r), reserve ratio

Making money

- Job of Bank of Canada to manage the money supply
    - **Money supply :** money available in the economy

Classification of money (measuring money)

- **Monetary base :** what is being “multiplied” by the banking system
    - Cash and bank reserve at the bank of Canada

- **M1+ :** includes currency/accounts held by public
    - Banknotes and coins and checking account balances (chartered banks, credit unions, caisses populaires, trust and mortgage company)

- **M2 :** everything in M1 plus personal savings accounts/non-personal notice deposits where money is locked away for a specified period
    - M1 X personal saving accounts
    - Non personal notice deposits

- **Central bank :** the institution ultimately responsible for managing the nation's money supply and coordinating the banking system to ensure a sound economy

- **Monetary policy :** consists of actions by the central bank to manage the money supply, in pursuit of macroeconomic goals
    - Manage supply of money

- **Lender of last resort :** mitigates bank runs
    - Lender to banks that cannot borrow anywhere else

issues/distributes Canadian bank notes; serves as fiscal agent for the federal government (banker for canadian gov, gov bank notes, foreign reserves and national debt)

Bank of Canada

- Managed by board of directors: governor, senior deputy governor, twelve independent directors, plus the deputy minister of finance (an ex officio non-voting member)

- all board members appointed by Minister of Finance, therefore controlled by Canadian government

Primary objective :

- to enhance the well-being of Canadians by contributing to sustained economic growth, rising levels of employment and improved living standards

- The Bank should mitigate, by its influence, fluctuations in the general level of production, trade, prices and employment, so far as may be possible within the scope of monetary action and generally to promote the economic and financial welfare of Canada."

- To fulfill its inflation control target, Bank of Canada manages the supply of money

Bank of Canada

- Bank of Canada has a number of different options at its disposal to change the money supply:
    1. **Reserve requirement :** minimum fraction of deposits banks reserve; most powerful tool
    2. **Open-market operations :** sell/buy government securities to/from banks on the open market
    3. **Expansionary monetary policy :** buy government bonds, increasing money supply/aggregate demand
    4. **Contractionary monetary policy :** reduce money supply in order to decrease aggregate demand

- Bank of Canada mostly focuses on interest rates, announcing “target” for the overnight rate or policy interest rate at which banks choose to lend reserves held at the Bank of Canada to one another, usually overnight

- there is a natural limit to how low the overnight rate (or any other nominal interest rate) can go
    - **zero lower bound** : natural lower limit on interest rates
    - monetary policy primarily influences the economy through changes in the interest rat

Monetary Policy tools

1. **Overnight rate :** Commercial banks hold demand deposits at the bank of Canada
    - Interest rate in very short term loans between commercial banks
    - Bank of Canada - triangle bank rate - triangle overnight rate - triangle money supply and interest rates more broadly

2. **Bank rate :** Interest rate charged by the bank of canada on loans to commercial banks
    - Increased bank rate leads to increase overnight rate - decrease in money supply
    - Decreased bank rate leads to decrease overnight rate - increase in money supply

Open market operations

- Bank of canada buys or sell large quantities of gov bonds - triangle money supply
- Buying bonds - increase money supply (open market purchases)
- Selling bonds - decrease in money supply (open market sales)

Reserve requirement

- Minimum reserves banks must hold against deposits
- Bank of canada - triangle reserve requirements - triangle money supply
- Increase in reserve requirements - banks hold more reserves - decrease money multiplier - decrease money supply
- Decrease reserve requirements - banks hold less reserves - increase money multiplier - increase money supply

Economic effects of monetary policy

- **liquidity-preference model :**
    - quantity of money people want to hold is a function of the nominal interest rate
    - Long run - money is neutral
    - Short run - monetary policy - economy (interest rates)

    - point where the supply of money meets the demand for money (r*) determines the nominal interest rate,stated price of money in the economy

- **expansionary monetary policy (re) :** more money in the economy, at lower interest rates
    - expansionary monetary policy pushes interest rates lower and puts more money into the economy
    - people spend and borrow more, increasing aggregate demand
    - Increase money supply
    - Natural limit - zero lower bound
    - in this case, monetary policy was able to pull the economy out of recession

- **contractionary monetary policy (rc)** : decrease in money supply; less money in the economy, at higher interest rate
    - contractionary monetary policy decreases the money supply, increasing interest rate
    - decreasing the money supply can cool down the economy when it overheats.
    - Decrease in money supply
    - Decrease aggregate demand

- if quantity of money demanded is really responsive to changes to the interest rate (a flat, elastic demand curve), then changes to the money supply will have a smaller effect on interest rates
    - Triangle r - quantity of money demanded (movement along the Md curve)

- if demand is less responsive to interest rate changes, curve is steeper, more inelastic

- The central bank does not have to wait for politicians to come to a consensus about the best policy to help the economy. Instead, the board of directors and the governing council, if necessary, can change monetary policy then and there.

Shifts to supply of money

- Decrease reserve requirements, decrease target for the overnight rate, buying bonds **(expansionary, shift right, increase money supply)**

- Increase reserve requirements, increase target for the overnight rate, selling bonds (decrease money supply, shift left, contractionary)

- Central bank (monetary policy) - interest rates - AD
- Decrease in interest rates - increase in AD
- Increase in interest rates - Decrease in AD

Slope of demand for money

- Small change in interest rates (more elastic)
- Greater change in the interest rates (more inelastic)

Summary

1. The three main functions of money are as a store of value, a medium of exchange, and a unit of account. Money derives much of its true importance from its role as a medium of exchange—from the fact that you can use it to purchase the goods and services you desire. Money is also important as a way to register the value of transactions

2. Money needs to have stability of value and be convenient. Items whose value varies from one day to the next will not be a good store of value and so are not suitable as money. Money also needs to be widely accepted in order to fulfill its function as a medium of exchange. The earliest forms of paper money could be legally exchanged into a specific amount of a named commodity (generally gold), making it commodity-backed money. Since 1933, Canadian money has been fiat money, created by rule rather than backed by a commodity

3. Banks keep on hand a portion of the money deposited, in case depositors want to withdraw money. This money is known as the bank's reserves, and the ratio of the original deposit to the amount kept as reserves is the reserve ratio. If the reserve ratio were 100 percent (a situation known as full-reserve banking), no lending would take place; all deposits would sit in the banks' vaults, and the financial system would grind to a halt. Fractional-reserve banking allows a reserve ratio of less than 100 percent, enabling banks to lend a portion of the money that has been deposited. By means of that lending, banks "create" money. The ratio of money created by the lending activities of the banking system to the money created by the government's central bank is the money multiplier

4. The Bank of Canada classifies different types of money by their liquidity—by how easy an asset is to convert immediately to cash without losing value. Cash and reserves physically held at the Bank of Canada are hard money, which can be used in transactions without delay. M1+ includes hard money plus chequable deposits (which are not exactly cash but are fairly readily accessible for most people at chartered banks and other financial institutions). M2 includes everything in M1 as well as things like savings accounts and term deposits that are generally harder to access immediately and so slightly less liquid than other forms of money

5. In any nation, the central bank's duties generally include maintaining the money supply and coordinating the banking system. In Canada, the central bank is known as the Bank of Canada. It has a mandate: to use monetary policy to enhance the well-being of Canadians by contributing to sustained economic growth, rising levels of employment and improved living standards. Price stability means maintaining a stable money supply that meets the needs of the economy, while keeping the purchasing power of a dollar relatively constant over time by preventing destabilizing levels of price changes. The Bank also has four essential functions: it is the sole issuer of Canada's bank notes, conducts monetary policy via managing the money supply, acts as the fiscal agent for the federal government, and acts as a lender of last resort

6. The Bank of Canada has three tools to conduct monetary policy. The first is changing the reserve requirement, or the regulation that sets the minimum fraction of deposits that banks must hold. It is usually seen as a rather blunt tool—powerful but inappropriate for most day-to-day economic maintenance. The second is the change in the target for the overnight rate, a lending facility among commercial bank to borrow and lend; the interest rate charged for these loans is the overnight rate. The change in the target for the overnight rate is one of the Bank of Canada's primary tools for providing liquidity to the markets and acting as a lender of last resort. The final and most used tool is open-market operations, in which the Bank of Canada sells or buys government bonds in the open market. Use of this tool alters bank reserves and influences overall interest rates

7. The liquidity-preference model explains that the quantity of money people want to hold (the demand for money) is a function of the interest rate, which the Bank of Canada controls. As the quantity of money supplied changes, the price of that money, reflected in interest rates, will change as well. Increasing the money supply (such as by buying government bonds on the open market) decreases interest rates. Decreasing the money supply (such as by selling government bonds) will increase interest rates.

8. Depending on the circumstances, the Bank of Canada may want to engage in either expansionary or contractionary monetary policy. Expansionary monetary policy involves lowering interest rates; the lower rates increase aggregate demand, helping to expand the economy. This action is generally taken in response to recessionary forces. Contractionary monetary policy involves raising interest rates, which shrinks aggregate demand and slows the economy; it generally is taken in response to inflationary forces.

Inflation

- overall rise in prices in the economy

Deflation

- Overall fall in prices in the economy

Statistics Canada measures two inflation numbers

1. **All items inflation (headline inflation)**
    - Measures the changes in prices for the entire market basket of the average urban household
        - All items purchased by a typical consumer

2. **Core inflation**
    - More stable measure of inflation that excludes goods with historically volatile prices
        - Not including food and energy

CPI (Consumer price index)

- Measure overall prices, calculate % change in the CPI ratio (cost of market basket from the cost of that basket in base year)

Neutrality of money

- in the long run, changes in the money supply effect real outcomes in the economy
- Triangle money supply do not affect real variables in the long run

Quantity theory of money

- **The value of money is determined by the overall quantity of money (supply of money)**
- **Increase in money supply - decrease in value of money - increase in prices - inflation**
- **Decrease in money supply - increase in value of money - decrease in price levels - deflation**

- **states explicitly that value of money (aggregate price level) determined by the overall quantity of money in existence (money supply)**
    - changes in the price level (inflation/deflation) primarily result from changes in money quantity
    - increased money supply leads to increased prices (inflation)

Price level :

- Price of basket of goods and services
- The value of money
- Increase in price level dollar buys less goods and services - decrease in the value of money
- Decrease in price level dollar buys more goods and services - increase in the value of money

Graphs

- **long run :** more money supply will leads to higher prices; output stays same
- **short run :** output and prices rise
- workers want higher wage
- output original level returns; prices increase even more.

Velocity of money

- number of transactions in which a typical dollar is used during a given period
- Assumed constant
- Velocity of money = P X Y (red output) / M (supply of money)

Quantity equation

- total money supply multiplied by the velocity of money is equal to the price level times real output
    - underlies the quantity theory of money
    - M (money) X V (velocity of money) = P (price level) X Y(red output)
    - Assume v constant :
        - MV = PY
        - Triangle M = triangle P
        - Increase M = increase P
        - Decrease M = decrease P

- Assume V constant
    - MV = PY
    - No triangle to M = MV constant
    - Y increase = p decrease
    - Y decrease = p increase

If V is not constant then the quantity theory of money does not hold

Classical theory of inflation

1. Initial LR equilibrium
    - Suppose increase MS
    - MS = decrease in interest rates = increase in AD
2. New SR equilibrium
3. New LR equilibrium (higher PL)

- **Demand– pull inflation :** demand pulls prices higher; too much money is spent chasing too few goods
    1. Initial equilibrium (AD increase)
    2. New SR equilibrium

- **Cost–push inflation :** rising cost causes firms to increase prices in order to maintain profit
    1. Initial equilibrium - increase in costs
    2. New SR equilibrium

Inflation

- Most damaging economic consequence of inflation is uncertainty; increases when amount/timing of inflation is unpredictable
    - **Menu costs :** cost of changing prices to keep pace with inflation; measured in money, time, opportunity
        - Costs of price adjustments
    - **Shoe - leather costs :** time, money, effort that must be spent managing cash in the face of inflation

        - Inflation holds less money
        - Resources lost from decrease in money holdings

    - **Tax distortion (bracket creep) :** tax distortions happen because tax laws take into consideration only nominal income, not what you can buy with it
        - Tax brackets (nominal income) - if not adjusted for inflation - tax distortion

- unpredictable inflation quickly eats away profit margins and causes price changes
    - **Real interest rates = nominal interest rates - inflation rate**
    - **If nominal rates are greater than the inflation rate**
        - **Real interest rates are +**
        - **Real value of savings and debts increase**
        - **Borrowers worse off**

- **If nominal rates are lesser than inflation rate**
    - **Real interest are -**
    - **Real value of saving and debts decrease**
    - **Savers worse off**

- changing prices affect interest rates; create a redistributive effect (transferring money either from savers to borrowers or vice versa)

nominal interest rate : reported interest rate, not adjusted for the effects of inflation
real interest rate : interest rate adjusted for the anticipated effects of inflation

Deflation

- overall fall in prices (a decrease in the aggregate price level); negative inflation
    - increases burden of debt, decreases consumption and income
    - Price level decrease

    - net result of expected deflation is to reduce the level of aggregate demand in the economy

- **Disinflation :** term for a period during which overall inflation rates, while still positive, are falling
- **Hyperinflation :** extremely long-lasting, painful increases in the price level; usually enough to render the currency completely valueless or close to it
    - Extreme and sustained increase overall price level

Deflation

- **Slight inflation is more favourable for three reasons:**
    1. allowing for a little inflation reduces the risk of deflation; modest positive inflation gives central bank leeway to make mistakes without deflation

2. more room for central bank to engage in expansionary monetary policy

3. positive inflation target makes it easier for firms to adjust real wages in the labour market in response to changing labour demand conditions without affecting productivity
    - Flexibility in adjusting wages

Inflation and monetary policy

- In practice, the goals of low inflation and unemployment are often incompatible.
- **Potential output** (full employment output) : total amount of output the country could reasonably produce if all people/capital resources fully engaged
- **Output gap** : economy's actual output differs from its potential at some point in time
    - negative output gap - resources not fully used
        - Output is less than potential output
        - Low inflation if no - supply shock

Negative output gaps and monetary policy

- Expansionary policy
- Increase MS, AD increase
- Unemployment decrease
- Price levels increase

Positive output gaps

- Contractionary policy
- Decrease MS , AD decrease
- Increase unemployment
- Decrease price levels

    - Positive output gap - economy working above capacity
        - Output is greater than potential output
        - High inflation
        - Low unemployment

- typically strong relationship between output gap and inflation
- ensuring full employment is really another way of keeping actual output near potential output

Graphs

- Short-run Phillips curve shows direct relationship between the annual inflation rate and the unemployment rate

- in favourable economy, prices increase at faster rate and unemployment will be low

- if unemployment increases, prices increase more slowly

- Result of two different aggregate demand curves
    - E1 shows a short-run equilibrium with lower prices and output than point
    - E2 on a higher aggregate demand curve

- with more economic activity, point E2 on the Phillips curve shows higher inflation and lower unemployment than point E1, which represents the short-run equilibrium with lower economic activity

The phillips curve responds to inflation expectations

- When the central bank increases short run aggregate demand, unemployment initially fails
- However , once the economy returns to the long run equilibrium, unemployment returns to the same level while inflation stays the same.
- If the central bank again tries to reduce unemployment it will succeed in the short run but inflation will go up. The economy would return to long run equilibrium and the pattern would continue with every effort

The long run phillips curve

- no trade-off between inflation/unemployment in the long run
- non-accelerating inflation rate of unemployment (NAIRU)
    - minimum level of unemployment
- also called natural rate of unemployment, orfull employment(even though not technically zero

Inflation and monetary policy

- calculating the exact NAIRU is difficult
    - differs among economies and over time due to variations in the structural components of unemployment, regulatory and competitive environment
    - NAIRU can change over time
        - can be difficult to know whether an economy is truly at full employment at any given time

Summary

1. Inflation is an overall rise in prices in the economy. Deflation is an overall fall in prices in the economy. Economists measure inflation or deflation by calculating the percentage change in the CPI. This is the ratio of the cost of the market basket in a given year to the cost of that same basket in a base year. Two different measures of inflation are used:all-items inflation(sometimes called headline inflation) is the measure of inflation

that includes all of the goods that the average consumer buys, while core inflation is the measure of inflation that excludes goods with historically volatile price changes. Statistics Canada's official measure uses core inflation because it is less likely to reflect shocks to individual product markets and more likely to show economy-wide inflation

2. Prices denote the nominal value of goods; the price level reflects prices when aggregated across the economy. The neutrality of money suggests that the money supply affects price levels throughout the economy, but in the long run has no effect on real variables in the economy, such as output. The neutrality of money implies that if the money supply suddenly doubled, nominal GDP would double as well, but real GDP would remain the same

3. The classical theory of inflation describes the relationship between the money supply, output, and the price level. The theory argues that the money supply has no effect on output in the long run. However, it shows how adjusting the money supply can change output in the short run. If the central bank adopts expansionary policy, it could increase the money supply, shifting the aggregate demand curve to the right and causing output and prices to increase. The effect on the cost of production and anticipation that these high prices will continue causes the aggregate supply curve to shift leftward until it intersects the demand curve at the original level of output

4. The quantity theory of money shows the relationship between the value of money in terms of the output we can buy and the quantity of it. Mathematically, the quantity theory of money indicates that the product of the velocity of money and the money supply (total spending) is identical to the product of the price level and real output (nominal GDP).
5. Changes in the quantity of money affect the price level. An increase in the money supply leads to inflation; a decrease in the money supply leads to deflation.

6. Inflation is an increase in the price level in an economy. Over the long run, inflation is often caused by increases in the money supply. In the short run, it is more often a result of the business cycle. If inflation rates are unstable, they introduce uncertainty into the market, often causing a decline in output. Even a stable rate of inflation can impose costs on the economy, including menu costs and bracket creep.

7. In contrast to inflation, deflation is a fall in the price level of an economy. Deflation is considered more dangerous than inflation. When prices are falling, borrowers have a more difficult time paying back their debts; deflation makes the debt more expensive over time, often causing borrowers to default. High default rates, in turn, lower prices, causing further defaults. A deflationary spiral often ensues, halting the economy

8. When central banks succeed at controlling inflation, disinflation often occurs. Disinflation happens when inflation rates are positive, but falling. A famous example of disinflation was Gerald Bouey's effort to stem inflation in the 1980s. When central banks fail to

control inflation, hyperinflation can occur. Hyperinflation is an extreme rise in price levels. It can cause an economic crisis and drastically reduce the value of a country's currency.

9. Although you might think that central banks want to achieve perfect price stability with an inflation rate of zero, most central banks around the world actually prefer modest positive inflation of around 2 or 3 percent per year. There are a few reasons for this. For starters, a little inflation reduces the risk of deflation, giving the central bank some leeway in case their monetary policy is too contractionary. Second, keeping inflation at a modest positive level leaves more room for the central bank to engage in expansionary monetary policy. Finally, positive inflation makes it easier for firms to adjust real wages in response to changing labor demand and supply condition

10. The central bank uses monetary policy to control inflation. Central banks prefer to keep inflation low, but positive. When full employment occurs, the economy is said to be producing at its potential output, the total amount of output a country can produce if its resources are used efficiently. The output gap is the difference between potential and actual output. When the output gap is negative, inflation will decrease. Central banks will then pursue expansionary monetary policy by lowering interest rates, allowing inflation to rise and bringing back full employment. When the output gap is positive, inflation will increase

11. The relationship between employment and inflation in the short run is modelled by the Phillips curve. The curve shows that a decrease in unemployment will be accompanied by an increase in inflation in the short run. The relationship does not hold over the long run, in part because of inflation expectations. If central banks pursue aggressive expansionary policy to reduce unemployment, inflation may spiral out of control. The level of unemployment at which inflation will remain stable is called the non-accelerating inflation rate of unemployment (NAIRU), or full employment.

International flows of goods and capital

- **savings (money to invest domestically (I) or abroad (NCO)) , investment, NCO**
- **S (national savings) = I (investment) + NCO (net capital flow)**

- **Y = C + I + G + NX**
- **Y - C - G = I + NX**
- **S (national savings) = private + public**
- **S = I + NX**
- **I + NCO = I + NX (NCO = NX)**

- **Closed economy :** does not interact with other economies
- **Open economy :** Interacts with other economies
    - Buys and sells goods and services in world product markets
    - Buys and sells capital assets in world financial markets

International trade

- Imports and exports are the most visible and straightforward aspects of international economics.Countries interact in other ways, as well, including through investment
    1. **Balance of trade :** value of exports minus the value of imports
        - Net exports = exports - imports
        - NX = 0, EX = IM
    2. **Trade deficit :** country imports more than it exports (negative trade balance)
        - NX (-) = Ex are lesser IM

    3. **Trade surplus :** country exports more than it imports (positive trade balance)
        - NX (+) = ex are greater IM

- **Foreign direct investment (FDI) :** firm runs part of its operation abroad/invests in another company abroad
    - Capital investment owned and operated by a foreign entity

- **Foreign portfolio investment :** investment funded by foreign sources but operated domestically; investors may purchase foreign financial assets (stocks, government-issued securities
    - Investment financed with money from abroad and operated by domestic residents
    - portfolio investment flows across borders quickly; mainly involves transfers between bank accounts
    - rapid movement of money across borders can overwhelm the country's financial markets

- **Net capital flow :** difference between capital inflows and capital outflow
    - Net capital outflow = capital outflow - capital inflow
    - NCO + (capital outflows are greater than capital inflows)
    - NCO - (capital outflows are lesser than inflows)

- **Net capital outflow (NCO) :** net flow of funds invested outside of a country (trade surplus)
    - domestic savings invested abroad
    - Domestic residents buying foreign assets

- **Capital inflows :** investments financed by savings from another country (trade deficits)
    - Foreign residents buying domestic assets

- **Balance-of-payments identity :** an equation that shows that the value of net exports equals net capital outflow; balancing trade deficits/capital surpluses
    - NCO = NX

- NCO + than NX + (more capital flowing out than in) - value of exports greater than imports
- NCO - (more capital flowing in than out) - value of imports greater than exports

International capital flow

- Demand for loanable funds (investment) comes from two sources :
    1. **domestic investment (domestic savings)**
    2. **international investment:**
        - capital inflow : money from abroad is invested domestically
        - capital outflow - domestic money is invested internationally

- market for loanable funds in open economy determined by domestic/ international investment and domestic savings

- domestic/international investment reflected in the I + NCO curve

- Interest rate determined by the intersection of the savings curve and the combined investment + net capital outflow curve

International capital flow

- **Foreign investment can**
    1. increase the GDP of the host country by giving it access to additional resources

    2. increase the GDP of the investing country by providing it with ways to earn higher returns on its capital

    3. make world more efficient by moving capital from places with low returns to places with high returns

    4. “flight to quality” - investors prefer lower-risk domestic government bonds as safer for saving

Graphs

- Flight to quality situation - combined investment plus net capital outflow (I + NCO) curve shifts to the left

- lower interest rate, more dollars invested in physical capital, and lower national saving

- government spends more than it collects in revenue, must borrow money

- pushes savings curve left, which results in an increase in interest rate and lower quantity of investment

International Capital flow

- high domestic savings can keep demand for local products low as people consume less

- saving too much can also lead to trade imbalances

- low interest rates relative to other markets encourage capital to flow abroad, raising net capital outflow

- massive net capital outflow requires that quantities of currency are exchanged into many different currencies

Exchange rates

- **Exchange rate** : price at which the exchange of currencies occurs; value of one currency expressed in terms of another
    - exchange rates affect nearly every dimension of international economics
    - often expressed in decimal form

- **Foreign exchange (forex)**: market for buying and selling foreign currencies
- **Exchange-rate appreciation :** value of a currency increases relative to the value of another
    - if currency appreciates against a foreign currency, goods become more expensive abroad; foreign goods become cheaper; net exports decrease

- **Exchange-rate depreciation** : value of a currency decreases relative to other
    - If currency depreciates against a foreign currency, domestic goods become cheaper abroad and imported goods become more expensive; net exports increase

Arbitrage :

- gaining financially by taking advantage of discrepancies in currency exchange rates

Exchange rates

- **Currency demand and supply**
    - price of the currency is the exchange rate
        - as exchange rate increases, the quantity supplied of dollars increases and the quantity demanded of dollars decrease

    - demand for currency comes from consumer preferences (foreign consumers, businesses, and governments) to use the currency to buy goods or services in the domestic currency

    - demand for dollars also depends on domestic and foreign interest rates

    - the perceived risk of investing in one country against the perceived risk of investing in other countries

- **Floating exchange rate :** value is determined by the market and freely trading the currency; exchange rate is set by the intersection of the supply and demand curves for foreign exchange
    - Determined by supply and demand in the foreign exchange market

- **Real exchange rate :** value of goods in one country in terms of the same goods in another country
    - Real exchange rate = nominal exchange rate X (domestic price level / foreign price level)

- **Nominal exchange rate (rate at which one currency is traded for another)**
- **Fixed exchange rate**
    - Set by the gov
    - Above or below the equilibrium rate - the gov intervenes in the market by buying and selling currencies
    - Fixed exchange rate greater than equilibrium exchange rate - gov buy foreign currency - sell domestic currency
    - Fixed exchange rate lesser than equilibrium exchange rate - gov sell foreign currency - buy domestic currency

Speculative attack

- **Speculators - doubt gov defence of currency - speculator sell the currency - gov cant defend - allows float = exchange rate drops**

- **No monetary policy**
- **Increase ms - decrease value of money - gov must buy own currency - policy ineffective**

Exchange rates - Graphs

- There is supply and demand for foreign currency

- supply quantity of currency increases as the exchange rate increases, and decreases as the price of currency increases

- price of the currency is called exchange rate

- As exchange rate from local to foreign currency decreases, the quantity of net exports increases

- with the lower price of goods, local goods will become attractive to foreigners, and foreign goods will be more expensive locally

- Bank of Canada tightens money supply; price of the dollar initially rises and supply decreases

- demand shifts out as well and the price of the dollar rises; quantity of dollars traded returns to the initial amount

- With an increase in the exchange rate of the dollar, the quantity of net exports falls, as domestic goods are now more expensive for foreigners

- when exchange rate is allowed to float, market for foreign exchange will operate at equilibrium price and quantity

- when fixed exchange rate that is set too low, there is excess demand for the currency, which the government must cover by buying foreign currencies and selling the local currency

- with fixed exchange rate, monetary policy cannot be successful; expanding the money supply, currency increases exchange rate falls

- government forced to buy back the local currency on foreign markets, restoring the exchange rate

Global financial crises

- In general, financial crises can be labelled as one of two types: debt crises and exchange-rate crises.

Debt crises

- when large share of government debt held by foreign investors who begin to worry about ability to repay; investors begin to move their money out of the country in a hurry, rather than risk losing it

Exchange rate crises

- Loss of confidence in government's ability to defend exchange rate can spook investors; government devalues exchange rate, it essentially represents a loss for those holding investments in the country

International Monetary Fund (IMF)

- when many countries had fixed exchange rates tied to gold, the IMF had the task of helping countries maintain their fixed rates
- when countries ran into trouble maintaining their currencies, IMF would step in, providing loans to patch up a balance-of-payments deficit
- IMF now often steps in as a lender of last resort to stabilize economies

The market for loanable funds in an open economy

- Supply of loanable funds
    - National savings

- Demand for loanable funds
    - Domestic investment (I)
    - International investment (NCO)
    - I + NCO

- NCO = domestic residents invest abroad - foreign residents invest domestically
- Interest rate in low - increase capital flow - capital inflow decrease - NCO high
- Interest rate in high - decrease capital flow - capital inflow increase - NCO low
- Equilibrium = S = I + NCO

Determinants of NCO

- Perceived risk and attractiveness of assets at home and abroad
- Government policies - foreign ownership of domestic assets (depends on the policy)

Suppose that domestic gov bonds are less risky and more attractive

- Domestic residents invest at home - NCO decrease
- Foreign residents invest domestically - NCO decrease
- Shifts I + NCO to the left
- I + NCO decrease
- R and Q decrease

Shifts to supply of loanable funds

- Suppose that Sprivate increase and national savings increase
    - R decrease
    - Q increase

The exchange rate market

- **Supply**
- Exchange rate : price of the currency
- High exchange rate
    - Quantity supplied high

- Low exchange rate
    - Quantity supplied low

Determinants of supply

- Consumer preferences - increase in preference for foreign goods - increase in S
- Interest rates - foreign interest rates increase domestic decrease - increase in S
- Confidence - increase in foreign domestic decrease - increase in S

Demand for currency

- High exchange rate
    - Quantity demanded low

- Low exchange rate
    - Quantity supplied high

Determinants of demand

- Consumer preferences - preferences for domestic goods and services increase - demand increase
- Interest rates - foreign decrease and domestic increase - increase in D
- Perceived risk - foreign increase and domestic decrease - increase in D

Equilibrium

- Xr*x , Q*
- XR (fixed) lesser than XR* (equilibrium) (shortage)
    - Gov sells domestic currency and buy foreign currency
- XR greater XR* (excess supply)
    - Gov buy domestic currency and sell foreign

Summary

1. The balance of trade is the value of exports less the value of imports. It is also called net exports. Net exports respond to the value of the exchange rate: when the exchange rate is high, domestic goods are expensive and foreign goods are cheap, so net exports are low. When the exchange rate is low, net exports are high.

2. There are two types of foreign investment. Direct investment is when a firm invests abroad with an active interest—for example, by building a factory and managing the factory. Portfolio investment is investment in financial securities, such as stocks or bonds, so that domestic residents still operate firms. Together, direct investment and portfolio investment give the net capital outflow of the country, a measure of the money a country invests outside its borders

3. The balance of trade and net capital outflow are related through the balance-of-payments identity which states that NX = NCO. This identity is an accounting identity: if a country has an imbalance of trade (positive net exports), it means that it has lent money to the rest of the world (positive capital outflow) to pay for these goods.

4. Net capital outflows are determined by the demand for and supply of net capital outflow. The supply of net capital outflows is national savings less domestic investment. The demand for net capital outflow is determined by the domestic interest rate and the

foreign interest rate. When the domestic interest rate is high, net capital outflow is low, because foreign money flows into the country. When the foreign interest rate is high, net capital outflow is high, because money flows out of the country to take advantage of high returns

5. Various events can influence the international supply and demand for loanable funds. An increase in confidence in an economy will cut net capital outflows, and lower the interest rate. A decrease in savings from an increase in the government deficit will shift the supply curve for loanable funds to the left, increasing the interest rate and decreasing net capital outflows

6. The exchange rate is the value of one currency expressed in terms of another currency. Exchange rates can be expressed in two ways, either in terms of the domestic (home) currency, or in terms of the foreign currency. Exchange rates can appreciate or depreciate, as the currencies strengthen or weaken against each other

7. The exchange rate is determined by demand and supply for domestic currency. Demand and supply are influenced by preferences for domestic and foreign goods and services, the domestic interest rate, the foreign interest rate, and the perceived riskiness of domestic and foreign investment
8. A fixed exchange rate is an exchange rate that is set by the government, not the market. Usually fixed exchange rates are set to maintain a steady relationship with another stable currency. A government maintains a fixed exchange rate by intervening in the foreign-exchange market, by either buying or selling foreign currency. A floating exchange rate, on the other hand, is set by the market. Floating exchange rates are set by the intersection of supply and demand for foreign exchange.

9. A fixed exchange rate necessarily means that monetary policy will not have an effect—any change to the money supply has to be counteracted by government actions on the foreign-exchange market to maintain the exchange rate. Monetary policy is more effective under a flexible exchange rate because the flexible rate can affect both investment and net exports

10. The real exchange rate is the nominal exchange rate corrected for the price levels in the domestic and foreign country. The real exchange rate is measured in terms of goods instead of currency. If the real exchange rate is 1, then a good can be exchanged in one country directly for a good in another country. If this is the case, we say there is purchasing power parity between the two countries

11. Although the financial system works well most of the time, financial crises can occur. The IMF often steps in as a lender of last resort when this happens,making loans to countries when private lenders flee. However, this is not always an ideal solution. Crises exist because countries often turn to international capital markets to finance expenses, meaning investors own the countries' debts. This can backfire if investors worry that the

government won’t be able to repay the debt or if they lose confidence in the government’s ability to defend the exchange rate